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ABSTRACT

This study examined the possible sources of variability in sign language mastery in two deaf children of hearing parents. The study considered the interaction of environmental and innate factors within the framework of the "Nativization" hypothesis, which suggests that all language learners initially construct a linguistic system which is somewhat unique and then gradually adapt to the environmental target language unless the input is inaccessible or inconsistent, in which case the learner creates grammatical constructions that further depart from the external norm. The ethnographic study focused on the sign language structure of the two children, ages 8 and 9, and the sign language used by their mothers. The study found that, when presented with a variety of input, deaf children of hearing parents show a preference for American Sign Language (ASL) as a target language. Hearing parents who are supportive of their children's involvement with deaf people and communicate in a way which approximates ASL appear to provide optimally useful environmental input. The child who was more advanced at a younger age in his grammatical development subsequently developed a greater range of stylistic variation in his signing. Appendices contain a glossary, hypothetical scenarios which typify four home environments for deaf children acquiring language, and guidelines for ethnographic data collection. (Over 100 references are provided.) (JDD)

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Boston University

School of Education

NATIVIZATION AND INPUT IN THE LANGUAGE DEVELOPMENT OF TWO DEAF CHILDREN OF HEARING PARENTS

Judith Lynn Mounty

B.S. Boston University, 1974
M.Ed. Temple University, 1976

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Education

1986

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Approved by

First Reader _____

James Paul Gee

Assistant Professor of Education

Second Reader _____

Paula Menyuk

Professor of Education

Third Reader _____

Robert J. Hoffmeister

Professor of Education

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The study is dedicated to my former students at the Hackett School in Philadelphia. As I watched them grow and learn, deep and pressing questions about language acquisition and deaf children formed in my mind. There came a point when I knew I had to find answers to my questions and that quest led to this dissertation study.

The process of completing this dissertation has allowed me tremendous personal and professional growth. I would like to express my appreciation to the many individuals who have shared this experience with me.

To begin with, I wish to thank the members of my committee for their guidance and support: Dr. James P. Gee (chair), Dr. Paula Menyuk, and Dr. Robert J. Hoffmeister. Each of them offered valuble insights and suggestions from their particular perspectives. I am, first of all, grateful to Dr. Hoffmeister, who knew me as a teacher of young deaf children some years ago. He encouraged me to explore my questions about language acquistion in deaf children and to pursue this degree in the process. Dr. Hoffmeister was a key person in the events that shaped the early lives of my research subjects. The children and their families were involved in an unique project that

he implemented. One of the subjects has also been involved in his longitudinal research on language acquistion in deaf children. I am deeply grateful to Dr. Hoffmeister for sharing this data with me. During my years at Boston University, he provided me with the opportunity to work with his graduate students in deaf education and to be part of the training of new breed of teachers.

Dr. Menyuk taught me much of what I know about language acquisition and psycholinguistics. She has supported my ideas and encouraged my research interests throughout the past four and half years.

Dr. Gee listened carefully to my ideas about how language is acquired by deaf children and led me to a theory that might explain what my experience had shown me. Challenging my intellect to the limit, he has contributed greatly to my knowledge in many areas and stimulated many new interests. He provided countless hours of instruction, guidance, and assistance every step of the way. I feel fortunate to have had him as my committee chair and mentor and look forward to our continued work together as colleagues.

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aspects of the study. Former Boston University graduate student, Denise Fleming, assisted in the data analysis and was a source of support during the first year of the dissertation. I must thank another Boston University graduate student and friend, Janey Greenwald, for her support and assistance in earlier projects which helped me formulate the ideas that are explored in this dissertation.

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NATIVIZATION AND INPUT

IN THE LANGUAGE DEVELOPMENT OF

TWO DEAF CHILDREN OF HEARING PARENTS

(Order No.)

JUDITH LYNN MOUNTY

Boston University, School of Education, 1986

Major Professor: James Paul Gee Professor of: Linguistics

Abstract

This descriptive study takes an ethnographic perspective in the examination of language development in two deaf children of hearing parents, L. and M.. It considers the interaction of environmental and innate factors in the acquisition process within the framework of the "Nativization" hypothesis (Andersen, 1980, 1983). This hypothesis suggests that all language learners initially construct a linguistic system which is somewhat unique, and then gradually adapt to the environmental target language (Brown, 1973; Slobin, 1977). However, when the input is inaccessible or inconsistent, the language learner continues to draw on his innate language capacity and creates grammatical constructions which further depart from the external norm (Bickerton, 1975; Andersen, 1983).

L. and M. were participants in an earlier study (Goodhart, 1984) which compared the acquisition of sign language by deaf children of deaf parents (DD) and deaf children of hearing parents (DH). Goodhart found considerable individual variation in both populations prior to age seven. Thereafter the two groups appeared

to take divergent paths in their sign language development. While the sign language of DD children had a great deal of morphological complexity, the signing of DH children, as a group, did not.

L., who was 5.6, at the time of Goodhart's study looked more like a DD child in that he already had a high percentage of morphologically complex features in his signing. By contrast, M., then 6.7 years old, had very little morphological complexity in her sign language. Although these two children came from similar educational backgrounds and had parents who used some form of signing in the home, they seemed to be taking different developmental paths.

The present study examines the sign language structure of the children, now three ,ears older, and the sign language used by their mothers. Grammatical and discourse aspects of the children's and mothers' signing are discussed in the light of ethnographic information about each family. Possible sources of individual variation in language acquisition are explored as the interaction of nativization and input is considered.

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Project Summary
Grant # G008430017

Original Project Title:
"The Effects of Parental Input On Language Development of Deaf Children"

Title of Final Report:
"Nativization & Input In The Language Development of Two Deaf Children of Hearing Parents"

Project Director/Principal Investigator: James Paul Gee
Student Investigator: Judith Lynn Mounty

Introduction

The project was a student initiated research study of deaf children's language acquistion. Recent findings (Goodhart, 1984) had shown that young deaf children display a wide range of variability in their development of certain grammatical features associated with American Sign Language. That same study indicated that deaf children of deaf parents (DD) uniformly attained mastery in use of these morphologically complex forms at about age seven, but deaf children of hearing parents (DH) continued to show considerable within-group variability. This researcher pursued the present study in the interest of examining the possible sources of variability in the DH population. The study was designed to explore the effects of parental input on the children's linguistic output based upon the premise that particular types of environments would interface with individuals' biological capacity for language in particular ways.

Adjustment in Focus

Originally, two families with hearing parents and two families with deaf parents were to be involved in the investigation. Early on,

however, it became clear that the magnitude of data collected from the two families with hearing parents was greater than what had been expected and would require substantially more time to transcribe and analyze than had been predicted. Furthermore, it seemed that an even more thorough analysis of the DH data would be more germaine to the focus of the study than a comparative analysis of DH & DD families. Consequently, the it was decided that the investigation would entail a study of two families of hearing parents with deaf children.

Progression of the Study As Scheduled

The study was organized within a framework of four stages and was planned to cover a sixteen month time period as follows:

Stage One: Preparation for the data collection
(scheduled time: two months)

Stage Two: Data Collection
(scheduled time: two months)

Stage Three: Data Transcription & Analysis
(scheduled time: six months)

Stage Four: Preparation of Final Report
(scheduled time: six months)

Stage One was successfully completed on schedule. Most of the data was collected during Stage Two as planned, but when Stage Three was in progress, it became necessary to collect some additional parent data. At that time, some supplemental data was also collected (of the

communication of Deaf adults that worked in the children's school) to support some of the information which was emerging from the data analysis.

Stage Three required substantially more time than originally predicted. Preliminary analysis of the data suggessted some paradoxical relationships in the children's grammatical development. Additional analyses were needed to provided a deeper and broader perspective on the data.

The children's signing was carefully analyzed for evidence of style shifting in response to specific social contexts. Both the children's and mothers' signing was subjected to a detailed descriptive analysis to gain information about their discourse styles. All of the data was further examined for evidence of innate processes operating on the input. These additional analyses extended Stage Three to nine months.

Finally, the preparation of the final report required an additional month beyond the six that were scheduled. In total, the project took four extra months and was completed in April 1986 instead of December 1985.

Summary of Project Findings

The major findings of the study are as follows:

1. When presented with a variety of input, DH children show a preference for American Sign Language (ASL) as a target language. It is a language characterized by its morphological complexity and use of

space, features which seem to be required of signed languages if they are to be maximally clear and processible.

2. The two families in the study shared some commonalities and exhibited some important differences with respect to ethnographic variables that seem to influence language development. The results indicate that hearing parents who are supportive of their children's involvement with Deaf people and communicate in a way which approximates ASL appear to provide environmental input which is optimally useful to the young deaf language learner.

3. Despite some differences in values and atittudes, both of the mothers' signing has become ASL-like over time. This gives further support to the argument that there is a natural inclination for signers to adjust their signing in the direction of ASL rather than some English-based system so that communication becomes more effective.

4. The child who was more advanced at a younger age in his grammatical development now has a greater range of stylistic variation in his signing. That is, while the children are now simliar in their grammatical development, they are different in how they use the ASL grammatical devices that they have. This finding suggests that future studies of deaf children need to devise measures which can assess both levels of sign langauge development, grammar and discourse, and the interplay between the two.

Presentation of the Study to the Professional Community And Dissemination of Information Yielded by the Study

A piece of the project became the focus of a paper co-authored by the Project Director and Student Investigator and presented by the Student Investigator at the conference on Theoretical Issues in Sign Language Research, University of Rochester, Rochester, New York, June 1986. The title of this paper, as yet unpublished is "Nativization, Variability, and Style Shifting in the Sign Language Development of Deaf Children of Hearing Parents." A collection of papers presented at this conference is currently being compiled into book form.

The Student Investigator, who has now completed her degree, regularly applies the contents of this study to her work with teachers of deaf students. A formal presentation which she has made since the completion of the final project report was to teachers of multiply-handicapped deaf students at the Perkins School for the Blind in Watertown, Massachusetts. The title of that presentation was, "Nativization & Language Development: Why what comes out may be different than what goes in."

This investigator plans to present material from the study in classes that she is scheduled to teach this academic year in the Deaf Education Program at Boston University where she is an adjunct faculty member. She is also in the process of writing a paper based on the data from this study which she plans to submit for publication to Sign Language Studies.

Introduction

This study evolved from a long-term personal and professional fascination with language learning. I grew up with a substantial hearing loss that either had been present at birth or was acquired before the age of one. Without specific intervention, I did attain a basic mastery of English. However, for some functions of language, spoken English was never fully accessible to me. My personal experience with deafness deeply sensitized me to the intricacy of the learning process in general and to the particularly powerful role of language in this process.

As a young teacher of the deaf, I developed the first "Total Communication" program within the public school system of the city where I lived. My students, for the most part, were five and six years old when the program began and all had hearing parents. However, they were a varied group in terms of degree of hearing loss, type of early intervention experience, and their families' attitudes and practices relative to deafness, communication, and education. I was learning ASL (see glossary) as a second language during that time and I was their "best" sign language model. As I watched their sign language develop, I saw forms emerge that were clearly not English and which had not been present in the input. At the time, I was reading the research on ASL, which basically dealt only with DEAF (with a small"d") individuals who had deaf parents. I found that this literature did not adequately explain the course of language development that I was observing in my students.

I had this sense that their language was somehow a mixture of ASL and English, and also had unique characteristics of its own. There was something that the children were contributing to the language learning process, individually and collectively. This "something" seemed to enable them to take pieces of the input (which included spoken English, English-based sign, and some ASL) and create a system which worked for them. I sensed that the "piece" which was especially compatible with their system was ASL, especially for the more creative functions of language, such as storytelling. My own ASL skills at the time did not seem sufficient to meet their needs in those areas and I felt tremendous frustration. I noticed that creative expression was difficult even for those children who could use English and English-based sign for other functions of language. My students were applying their biological capacity for language acquisition to the input and innovating a linguistic system that was more functional for them than the input itself. Yet, for some functions of language, it seemed that neither the available input nor their innovated system was fully adequate.

I also noticed that, in writing, my students, as well as older deaf students who were involved in the program (and had not been exposed to any form of signing up until the age of ten), used structures that were more similar to ASL than English. Thus, it seemed that deaf students had some sort of innate inclinations about language that were structurally similar to natural sign languages. Furthermore, this seemed to be the case for deaf children who had been exposed to sign as well as those who had not.

It was years later that I first read about pidgins and creoles. Yet, I immediately saw a parallel between the situation which had

confronted my deaf students and the conditions which produce pidgins and creoles. I had been a doctoral student in the Applied Psycholinguistics Program at Boston University for perhaps a year and a half when James P. Gee joined the faculty. We began discussing my ideas about deaf children's language acquisition and its possible similarity to the pidgin and creole situation. Together, we explored the extant literature which suggests that ASL may be a creole (e.g., Fischer, 1978; Woodward, 1973) and the literature on spoken pidgins and creoles. The book which had the greatest relevance for me was Andersen's (1983) volume in which the concept of "nativization" was explicated. It is a concept which, at once, accounts for the commonalities shared by all language acquirers and also explains the uniqueness of pidgins, creoles, and deaf language acquisition. The nativization hypothesis of language acquisition will be detailed in Chapter 1 of this text.

Around the time that Dr. Gee and I were introduced to the Andersen (1983) book, Dr. Wendy Goodhart was completing her (1984) dissertation. In her study, she found that deaf children of deaf parents (DD) and deaf children of hearing parents (DH) took different courses in their sign language development after about age seven. Goodhart also found that there was tremendous variation within each of these two groups, especially between the ages of three and seven. It seemed that in depth case studies of individual children might illuminate the sources of this variation. Dr. Goodhart and I have been friends and colleagues for a number of years. Both of us had known some of the children in her study and their families for some time. Thus, we had access to both current and past ethnographic information about them. With her support and

encouragement, I decided to undertake further study of two of Goodhart's DH subjects.

I selected these two children, who will be referred to as L., and M., for several reasons. I wanted to explore the interrelationship between environmental input and the biological capacity for language. In Goodhart's study, L. and M. appeared to be following dramatically different courses in their sign language development. Both children have the good fortune to have unusual hearing parents. These parents learned to sign soon after the children were identified as being deaf. They have been devoted to learning about deafness and are intensely committed to meeting their children's needs. Both L. and M. have had more linguistic input from their primary caretakers than is typical for DH children. Yet, neither has full access to their parents' native language (i.e. English). It seemed that their situations would allow for a study of DH language acquisition under the best possible circumstances, and also a chance to explore the bases for individual variation within that population.

I felt that this sort of investigation would be interesting from a linguistic perspective and would also have important implications for future research in language acquisition and for Deaf Education. Linguistically, it offers further insight into the human capacity for language acquisition. The study further suggests that this biological capacity may get expressed in a specific way in a signed language. Furthermore, the study suggests some of the ways in which input may make a difference for deaf children acquiring language from hearing parents. Future studies might further investigate both of these facets of language acquisition using both ethnographic and experimental paradigms.

The present investigation may also assist educators in designing early intervention programs and learning environments which are optimally compatible with deaf children's natural language learning tendencies.

Explanation of Notation Appearing within the Text

1. Appendix I. is a glossary of terms which are frequently used in the text. Each term which is defined in the glossary will be in all capital letters the first time it appears in the text.

2. Sign glosses are presented in capital letters.

   e.g. SIGN

3. Fingerspelled words are presented in capital letters with dashes between letters.

   e.g. S-U-C-T-I-O-N

4. A line typed above a sign gloss with the letter, "Q" indicates that the segment is expressed with an ASL facial expression for questions.

   e.g $\underline{\qquad Q \qquad}$
   YOU EAT DINNER

5. When a segment is simultaneously signed and spoken, the spoken component appears in lower case letters beneath the gloss of the signed component.

   e.g. WHILE IT IS NEW IN YOUR MIND...
   while it is fresh in your mind....

6. Words which appear in parentheses next to a gloss provide information about the larger discourse context or suggested interpretation of the gloss within that context.

7. CL is an abbreviation for classifier (see glossary for definition)

8. The "by-legs" classifier refers to animate beings which move/go by legs.

9. Other frequently used classifiers are:

   B-CL....wide, flat objects

   S-CL....solid, round objects

   3-CL....vehicles (e.g. trains, cars, trucks)

   C-CL....mostly used in this text in one of two contexts: either as a two handed SASS (see glossary) for describing an arc-shaped structure (e.g. bridge or tunnel) or in representing an animal's cupped paw with something attached to the bottom. The latter could also be referred to as a 5-claw classifier or handshape.

10. Handshapes which are not classifiers or are not used as such in a specific context are referred to as "handshape" or "hand," e.g. "L" handshape or L-hand.

Explanation of Prose Descriptions

In this thesis I have used prose descriptions of the children's signing, for three reasons. First, no notation system that captures anything close to the full range of significant structures in ASL has become uniform in the field. Second, the use of any sophisticated notation system renders the examples inaccessible to most people not directly in ASL linguistics. Third, children's signing in ASL, even more than adults' signing, contains many forms and features that are simply not captured in current notation systems, especially when we are dealing with narratives. Transcripts of all narratives, as transcribed by a Deaf linguist using a system described in Chapter Two, are available on request.

Chapter One

Theoretical Framework and Review of the Literature

1.1 Introduction

The present study is built upon the premise that all language acquisition involves what Andersen (1980, 1983) calls "nativization," a process whereby the individual learner initially constructs a system which is in some respects distinct from the environmental target language and then gradually modifies this system until it matches the external norm (Andersen, 1980, 1983; Brown, 1973, Slobin, 1977, 1981, 1982, 1983; Suti and Friel-Patti, 1982). However, in situations where the environmental language is to some extent either inaccessible or inadequate, the individual extends the process of grammar construction according to the internal norms which his biological capacity has equipped him with (i.e. what Chomsky, 1965 has called the L.A.D. or Language Acquisition Device). Thus, the individual takes a course of development which departs further from the target language (Bickerton, 1975, 1981; Fischer, 1978; Andersen, 1980, 1983). The concept of extended nativization is useful for describing some second language situations, most notably those conditions which give rise to the development of pidgins (which in turn sometimes give rise to creole languages). It is also a concept which will be shown to be extremely helpful in the development of a descriptive framework for explaining the nature of language acquisition in the deaf population.

This framework for acquisition will be outlined in the next section (1.2) while discussing notions from the literature on spoken language acquisition which have particular relevance for situations in which access to input is constrained or where the input is somewhat inadequate. In section 1.3, a brief summary of the origin of American Sign Language as a community language will emphasize the role of nativization in its formation and continuation (extensive coverage of the history of ASL and the DEAF COMMUNITY is provided elsewhere - see, for example, Stokoe, 1960, 1978; Woodward, 1978 & 1982; Baker & Cokely, 1980; Moores, 1982; Lane, 1984). In the light of the nativization framework, section 1.4 deals with the various forms of signing provided as input for deaf children and the meanings of terms such as "total communication" and "bilingual education". Thereafter, in Section 1.5, the growing body of literature on acquisition of American Sign Language by deaf children of deaf parents (referred to in this paper as the DD population) will be summarized - again from the perspective of nativization. However, since the DD acquisition literature has been reviewed extensively elsewhere (Klima & Bellugi, 1979; Hoffmeister & Wilbur, 1980; Bellugi & Klima, 1985; Moores, 1982; Newport and Meier, 1984), this literature will not be detailed here. Finally, in section 1.6, this same descriptive framework will illuminate the common thread in the work of a growing number of researchers who have been taking new perspectives in the study of language acquisition by deaf children of hearing parents (referred to as the DH population in this paper).

1.2 Nativization as a Framework for Language Acquisition

In a basic sense, all language acquisition is characterized by the same underlying series of processes (Slobin, 1977, 1983; Andersen, 1983; Valdman, 1983; Schumann, 1978, a., b.; Schumann & Stauble, 1983). That is, an infant acquiring a first language in typical circumstances, a second language learner who has a first language to build upon, a community of pidgin speakers, children who form a creole based on pidgin input, and deaf individuals developing language without full access to auditory stimuli, all follow the same steps in progressing towards the environmental linguistic norm. However, in some of these cases the process is interrupted at a particular stage and language development continues on a different path.

In first language acquisition, the infant at first constructs a linguistic system having a grammar which reflects certain universal core properties of the human bioprogram for language (Chomsky, 1965; Bickerton, 1981, 1983; Gee & Kegl, 1982) and which is suited to his developing cognitive abilities (Slobin, 1975; Fischer, 1978). Although the child uses the phonology and sometimes some of the lexicon of his caretakers' language even in his early utterances, the child's syntax and semantics may bear little resemblance to the adult model for some time (Slobin, 1977, 1981, 1982, 1983; Wanner & Gleitman, 1982). In fact, at this early stage, child grammar strikingly resembles the grammar of creoles (Bickerton, 1975, 1981, 1983). Apparently, in the early stages of language development, the

individual seeks to express the most salient or protypical notions of human experience and uses what he is able to derive from the input language to this end (Slobin, 1983). If the child and his caretakers encounter no barriers in their communicative interaction, the child will begin to use the caretakers as his Language Support System or LASS (Bruner, 1983). That is, a caretaker, in interacting with the child (and his bioprogram or LAD) will facilitate the child's entry into a particular linguistic community. According to Bruner, the adult does this by helping the child to learn not only what to say but how and with whom to say particular things. Bruner explains that the interaction patterns which develop between adult and child must ultimately become reversible if the LASS is to be fully functional. In cases of first language acquisition where the child doesn't have full access to the adult language, or where the adult language is so variable that the child cannot draw consistent generalizations during the interaction processes, the LASS breaks down. Thus, in the development of creoles and in deaf language acquisition, children who have primary input that may be structurally constrained, (Bickerton, 1975, 1981, 1983; Fischer, 1978; Mounty 1984 a. & b.; Gee & Goodhart 1985), may also be deprived of adequate access to language related socialization experiences with their caretakers. In second language acquisition, a similar (although normally temporary) obstruction occurs in the interaction between the language learner and experienced users of the target language.

In second language acquisition, the language learner typically constructs a dynamic system which is distinct from both his first language and the new target language. To some extent this

transitional system or "interlanguage" (Grosjean, 1982; Andersen, 1983) contains elements of the first language, but it also includes some of the same core properties that universally emerge in child grammar. The language learner gradually assimilates that part of the input which he is able to understand or process (Andersen, 1983 calls this portion of the input "intake") into his existing system. Thus, the formation of an interlanguage may be conceptualized as nativization in second language acquisition. In time, the language learner increasingly accommodates his own system towards the external norm or denativizes in the direction of the target (second) language. For some individuals, denativization progresses very slowly and they may persist in using their interlanguage in some contexts where the second language is required. To the extent that the individual's substitution of the interlanguage is functional for that purpose - i.e. that he can communicate effectively with users of the second language in that situation, the individual's denativization may cease in some domains (Grosjean, 1982). If denativization in second language learning is blocked because of inaccessibility of the target language, an individual or a group of language users may take an alternate route. That is, instead of gradually modifying the interlanguage in the direction of the target language, nativization is extended and innovated forms are used to fill the gaps created by the unavailability of the target language. This is basically how pidgins form (Andersen, 1983; Schumann & Stauble, 1983; Gee & Goodhart, 1985).

Pidgins arise when speakers of diverse languages interact in contexts in which access to native speakers of the prestige language

is highly constrained by geographical, political, economic and/or social factors. Pidgins have arisen, for example, during times of mass colonization by imperialist powers, in situations of forced enslavement of peoples from diverse language backgrounds, and in certain commerce and trade centers throughout world history (Bickerton, 1975, 1981; Fischer, 1978). The development of a pidgin typically follows one of two basic courses reflective of prevailing economic, political and social conditions.

One course is that the pidgin functions as a second language for several communities engaged in mutual trade relations or some similar form of limited interaction over a time frame of perhaps several generations. In this case the individual communities retain their respective primary languages for other purposes and provide those community languages to new generations as first language input. At the same time, the pidgin by virtue of its continued use as a lingua franca slowly gains grammatical complexity, becomes more stabilized within and across users and may gradually expand to fulfill an increasing range of linguistic functions as a second language. An example of such a prolonged pidgin situation is Tok Pisin, which only recently has begun to become creolized due to relocation of speakers of diverse languages to urban settings (Sankoff & Laberge, 1973; Muhlhauser, 1980). Muhlhauser characterizes an expanded pidgin such as Tok Pisin as one which has morphological devices that allow for word formation processes. Thus, for example, through the use of reduplication as an intensifier, the word "krugut," meaning "crooked" may be modified to "krukrugut," which means "very crooked" and the use of a morphological causative

produces "krugutim," meaning "to make crooked". However, Muhlhauser's analysis stresses that only children creolizing Tok Pisin would produce, through recursion (first applying the morphological process of reduplication followed by application of the causative process), the form "krukrugutim," which means "to make very crooked." Hence, the children extend nativization processes to generate forms that add further derivational depth and referential power to the already complex language that adults have provided as input. This type of pidgin scenario is useful for observing the contribution that adults can make to the formation of languages. The expanded pidgin model will be shown to have its parallel in the acquisition of ASL by second generation deaf people (i.e., the DD population) and the evolution of ASL at the community level. However, it is distinctly different from the second course seen in pidgin development, one described extensively by Bickerton (1975, 1981, 1983).

Bickerton describes the formation of Hawaiian Creole English (HCE) from Hawaiian Pidgin English (HPE) in scarcely more than a generation. The dramatic influx of laborers in 19th Century Hawaii resulted in an extremely heterogenous population characterized by frequent intermarriage between persons of different language backgrounds who had limited access to native English speakers and communicated primarily in a recently formed and highly unstable pidgin. Like all pidgins, HPE lacked the full range of complexity and grammatical devices associated with natural languages (including creoles). Children in Hawaii who received HPE as their primary linguistic input were forced to extend nativization processes

individually and collectively to form a language that would meet all their needs for linguistic communication. Thus, HCE arose in the first generation of offspring of HPE users. Bickerton considers this population to be particularly strong evidence of the resilience of the human biological capacity for language. Other researchers in search of a data base for examining the most natural and central properties of language formation have chosen to study the DH population (Tervoort, 1961; Lennenberg, 1964; Goldin-Meadow & Feldman, 1975; Goldin-Meadow, 1982; Goldin-Meadow & Mylander, 1984; Goodhart, 1978, 1984; Scroggs, 1981; Suty & Friel-Patti, 1982; Mohay, 1982; Livingston, 1983; Von Tetzchner, 1984; Gee & Goodhart, 1985; Strong, 1985).

1.3 A Brief Description of the Origins of American Sign Language

Prior to the nineteenth century, there was no formalized education for the deaf in the United States, and no unified Deaf Community or national sign language. However, community sign languages arose wherever deaf people congregated, and presumably, many families with deaf members developed their own home sign communication systems. These sign systems, very likely, reflected the results of extended nativization within a manual-visual-spatial modality. The situation changed dramatically in 1817 when the first school for the deaf in America was opened in Hartford, Connecticut by Thomas Hopkins Gallaudet with the assistance of a deaf French educator, Laurent Clerc. For the first time, large numbers of deaf people from different areas of the country came together to obtain an

education and establish a community. They brought with them their various sign languages which were subsequently influenced by the varieties introduced by Clerc. These most likely included both the type of signing used among French deaf adults as well as a pedagogical form of sign that attempted to represent French on the hands. The formation of ASL was also affected by the presence of English-speaking hearing people and the likelihood that a sizeable segment of the deaf population at that time acquired their deafness from childhood diseases (which in more recent times have been prevented or their effects mitigated). Having been born hearing, these individuals would have acquired English as a first language, which would mean that English influences were present when ASL was being developed as a community language. Given this scenario, it is likely that during this historical time, as is true today, deaf people were surrounded by and used several varieties of sign, including some that had a heavy concentration of English features. In sum, the birth of ASL involved some influence of French and the interaction of French Sign Language (FSL) with a multitude of sign languages that had already arisen as the result of extended nativization processes (Erting & Woodward, 1979). While English was the superstrate or prestige language of the larger hearing community, it could not directly function as a lexifier language for ASL. In spoken creoles, the lexifier language affects the phonology of the creole but in the formation of ASL, this would have been impossible given the different modalities. Nonetheless, in terms of the interaction of different languages at the outset, and the part played

by nativization there is a similarity between how ASL was formed and the formation of spoken creoles.

In the nearly one hundred and seventy years since the time of Gallaudet and Clerc, ASL has retained its creole-like structure (Fischer, 1978; Mounty, 1984b.; Gee & Goodhart, 1985). Gee & Goodhart (1985) claim that, while some denativization of ASL in the direction of English has occurred, for example in the formation of relative clauses, it is a process which has not and cannot go very far given the differences in modality. Several researchers point out that ASL contains many of the features shared by creoles around the world (Deuchar, 1983; Feldman, Goldin-Meadow & Gleitman, 1978; Fisher, 1974, 1978; Mayberry, Fischer & Hatfield, 1983; Meier, 1984; Newport, 1981, 1982; Woodward, 1973) and all of the features of English-based creoles (Fischer, 1978). However, Gee & Goodhart (1985) stress a major difference between spoken creoles and ASL. While creoles characteristically do not have much inflectional morphology--ASL has a lot, a distinction which appears to be modality related. The structure of creoles suggests that the human biological capacity for language does not seem to favor the development of complex inflectional morphology. Yet, sign languages appear to require MORPHOLOGICAL COMPLEXITY in order to be maximally processible and producible. Hence, nativization in the visual-spatial modality appears to be biased towards development of this feature.

The research which has thus far been completed on sign languages other than ASL suggests that there are cross linguistic structural similarities among sign languages of the world and in the patterns of acquisition of sign languages by deaf children around the

world (Von Tetzchner, 1984; Bellugi & Klima, 1985). Thus, the notion of extended nativization is clearly a feasible explanation for the linguistic evidence that both natural sign languages and spoken creoles of geographically dissimilar origins share structural properties (Bickerton, 1975, 1981; Bellugi & Klima, 1985; Fischer, 1978).

While similar social conditions generally prevail in the formation of both creoles and natural sign languages (Cokely, 1983), Fischer (1978) and Gee & Goodhart (1985) agree that such factors can only partly account for the phenomenon of structural similarity between the two. In ASL (and similarly in most creole situations), the social factors have to do with the long history of ASL as a stigmatized language and the lack of access of the deaf population to the prestige language. Due to the history of repression of sign language in deaf education, and the subsequent lack of deaf leadership, ASL became a secret language used by deaf adults only in the privacy of their homes and social gathering places. However, this stigmatization of ASL was preceded by a period when the language and culture of deaf people was viewed in a more positive light by the larger hearing society.

The early days of deaf education in America (approximately 1817 - 1860's) were characterized by a deaf leadership in residential schools which fostered the enculturation of deaf children into a Deaf Community from an early age. Thus, deaf children from hearing families had, as their primary agents of culture and models of language (i.e. Bruner's LASS), deaf peers from deaf families and deaf adults. The course of deaf education and of ASL development was then

drastically altered in 1880 when the International Congress on Deafness issued a proclamation prohibiting the use of Sign Language in the schools. This ultimately resulted in the virtual disappearance of deaf adults from the educational setting where they had had a great influence on the language of deaf children. This situation has just begun to be reversed in the last seven or eight years (Baker & Cokely, 1980; Gannon, 1981; Moores, 1982).

Consequently, ASL became a highly secretive and stigmatized language used among deaf people in exclusively social contexts. This restriction alone, very likely, has contributed to ASL having remained a language focused more within what Givon (1979) has called the PRAGMATIC MODE and may have restricted its lexical expansion. Since ASL was not sanctioned for use in educational or business settings or in the public arena, it did not expand stylistically or referentially in these domains. At the same time, many deaf people were unable to develop full linguistic or communicative competence in English. Hence, their educational and occupational progress was compromised by the stigmatization of ASL.

It seems that ASL has continued to be the norm towards which deaf individuals, exposed to a variety of input, naturally gravitate (Fischer, 1978; Goodhart, 1978, 1984; Strong, 1985; Suti & Friel-Patti, 1982; Gee & Goodhart, 1985). It has survived the hearing majority's monumental attempts to eradicate or at least whitewash it (e.g. by replacing it with invented systems that are designed to represent English). ASL seems to re-nativize in each generation. This and the particular requirements for a language to be maximally efficient in a visual modality appear to be the reasons why ASL

maintains both its unique structure and its similarity to spoken creoles (Fischer, 1978; Goodhart & Gee, 1985; Bellugi & Klima, 1985).

Very recently, ASL has begun to gain new recognition as a language in its own right, and respectability as the official language of the American Deaf Community (Gee & Goodhart, 1985). In the past, DEAF (deaf with a capital D) people would not use ASL with outsiders, preferring it to be a vehicle for maintenance of group identity (Markowicz & Woodward, 1975, 1978; Woodward, 1978; 1982). Now increasing numbers of hearing persons are taking courses in ASL (Cokely, 1983). The increased prestige of ASL may have an interesting effect on the deaf child's over-all acquisition of language. When the child does get adequate input in ASL, and takes it to be prestigious, he will have a desire to denativize towards it. At the same time he may take English as prestigious and may have a desire, although it is at times structurally incompatible with his nativized system, to denativize towards it. Thus, ASL is unique in that it is a target of denativization (in competition with English) and in part evolves out of nativization in the early years, i.e. here denativization and nativization can mutually support each other (Gee & Goodhart, 1985). At the same time, fewer deaf children are being educated in residential schools. Public Law 94-142 has been interpreted by educators and the public as a mandate for deaf children to be mainstreamed into school settings for hearing children. In many of these settings there are small numbers of deaf children, few, if any, deaf staff people, and less of a chance that the DH children will have DD peers. Consequently, DH school children

frequently lack exposure to ASL, the standard community language of deaf adults.

Yet, evidence suggests that their sign language is characterized by the presence of ASL-like features (Livingston, 1983; Strong, 1985). The population of deaf children, who are using processes associated with natural sign language are, for the most part, students in programs which proclaim to practice "total communication," a term which will be discussed in the next section of this chapter. It will be interesting to see how the combined influences of increased status of ASL, the decline in residential schools, and the types of linguistic input available to deaf children, will in time affect the language of deaf people in individuals and within communities.

1.4 Linguistic Input to Deaf Children in Educational Settings

In the early 1970's, disillusionment with exclusively oral approaches to communication with deaf children lead to the advent of pedagogical sign systems and an educational phenomenon known as "total communication" (Baker & Cokely, 1980; Moores, 1982; Freeman, Carbin, & Boese, 1981). The pedagogical sign systems were invented by persons who wished to facilitate deaf children's access to English by precisely representing it in a manual modality. Although there are distinguishing characteristics between these invented sign varieties, they generally share certain commonalities.

These systems are intended to be used in conjunction with speech or mouth movements - i.e. in a simultaneous communication

approach. Most of the base vocabulary units are ASL frozen (i.e. non-productive, uninflected, citation signs). Many of these signs are altered by a process, known as "initializing," which involves substituting the original handshapes with a handshape that represents the first letter of the corresponding English word. Fingerspelling is kept to a minimum. English word order is adhered to at all times. Additional signs are inserted in sentences to represent English prepositions, determiners, and morphemes for tense, aspect, and for deriving words from other classes of words in English (For a more detailed description of the specific systems, see Klima & Bellugi, 1979; Wilbur, 1979; Baker & Cokely, 1980; Moores, 1982.).

The originators of these sign systems included deaf individuals and hearing persons who had deaf parents (Baker & Cokely, 1980; Gannon, 1981). However, the systems fail to account for possible developmental and processing constraints which may severely limit their usefulness for a deaf child who has never heard English normally. Since signs are made with larger muscles than speech and take longer to produce than spoken words, strict adherence to English syntax and use of simultaneous speech may impose a cognitive and perceptual overload on the deaf child (Suty & Friel-Patti, 1982; Kluwin, 1981; Marmor & Petitto, 1979; Klima and Bellugi, 1979; Swisher, 1984). An additional drawback to the use of these systems as primary linguistic input for deaf children is that they do not have a mechanism for conveying forms prevalent in actual spoken discourse such as "wanna" and "gonna" (Kluwin, 1981). Thus, the normal variety in register and style provided in the syntactic, semantic and discourse structure of all natural languages, including

ASL, may not be available to the deaf child who has as primary input, one of the English-based systems (Swisher, 1984; Baker & Cokely, 1980). Furthermore, deaf students taught by teachers who use these systems for English language instruction do not necessarily develop English language competence through such instruction (Maxwell, 1983).

"Total communication," was a term coined by a deaf man, Roy Holcomb. It was an approach introduced with the hope that it might increase deaf children's ability to access language and information in their environments (Gannon, 1981). Early proponents of "total communication," which was intended to be a philosophy and not a method of communicating, cited the superior linguistic and academic abilities of DD children as support for bringing sign language back to the educational arena (Moores, 1982). The goal of "total communication" or TC was to tap all of each child's potential in terms of sign language, residual hearing, speech and speechreading ability, and literacy development (Freeman, Carbin & Boese, 1981; Moores, 1982). In implementing TC, some educational programs have sacrificed various of these components, but the one vital aspect conspicuously absent from most TC programs is ASL (Freeman, Carbin & Boese, 1981). In these programs some form of English-based sign is used along with simultaneous speech. With rare exception, ASL is still not sanctioned as a language of instruction in the education of deaf children (Kannapell, 1978, 1982; Lane, 1984; Strong, 1985). A few unusual programs which do place ASL on a par with English have adopted a bilingual and bicultural approach to the education of deaf children.

In bilingual/bicultural programs for deaf children, there is an inherent assumption that ASL can be acquired as a first language, but that, for most children, English can best be learned as a second language. The rationale behind this approach is that ASL will be more accessible as a first language for most deaf children since it is not a language based upon the ability to hear normally. A bilingual/bicultural approach presumes the necessity of Deaf adults being present in the school environment to provide native language input in ASL, serve as positive role models (Freeman, Carbin & Boese, 1981), and expose deaf children to Deaf culture. Thus, a bilingual program for deaf children would fully realize the deeper meaning of "total communication," while being responsive to the nativization processes that operate in both the DH and DD populations.

1.5 Deaf of Deaf Language Acquisition

The literature on DD language acquisition generally presents the situation as being analogous to a hearing child acquiring a spoken language from hearing parents (reviewed extensively by Klima & Bellugi, 1979; Wilbur, 1979; Hoffmeister & Wilbur, 1980; Moores 1982; Newport & Meier, 1984; Bellugi & Klima, 1985). Various researchers, focusing on specific aspects of language acquisition, have observed a number of similarities. Following a similar sequence of acquisition, DD children exhibit a full range of semantic relations at an early age, produce their first sign even earlier than first spoken words appear, produce forms that are not present in the input (normal nativization, possibly extended nativization), acquire handshapes in

accordance with motoric maturation (similar to hearing children's mastery of articulation of speech sounds) and follow a course of syntactic development (in terms of word ordering strategies) which moves from the universal to the specific.

The development of pronominal reference proceeds in a sequence similar to that in oral language development, even though it takes a different form. For example, in ASL, ROLE PLAY is a device used in narrative discourse. On the surface, it may appear to look like "acting out" or pantomime. However, role play is a sophisticated aspect of the pronominal referencing system and takes some time to master (Loew, 1984). The early, pre-linguistic pointing behavior of all children comes to be replaced by referential pointing which is characterized by systematic linguistic milestones in deaf children, whereas it is replaced by spoken words having specific referential significance in hearing children at around the same time. Deaf children use the index finger, (called the "Point" by Hoffmeister, 1978, 1980) for indicating the lexical items "I" and "you". In their acquisition of linguistic pointing, they make errors similar to those made by hearing children acquiring the pronouns "I" and "you" (Bellugi & Klima 1985; Petitto, 1983). Since ASL is extremely morphologically complex, DD children take eight to nine years to fully master that domain of the language, following a time frame akin to that of children acquiring typologically similar spoken languages (Kantor, 1980). Deaf children master some of the morphology quite early -- those aspects which are more agglutinative. However, the full CLASSIFIER system -- being fusional in nature (the classifiers are typically incorporated into verbs of motion or location) is

acquired later. The incorporation of nominal elements (the classifiers) with verbal elements is an example of the complexity of ASL. The deaf child must analyze incoming data into its component parts and master production of the language's subsystems. It also appears that deaf children are not at all aided in the acquisition process by the seeming iconicity of ASL (Bellugi & Klima, 1985). Instead, they apply a morphological strategy (acquiring forms in accordance with increasing linguistic complexity) in their acquisition of verb agreement as do hearing children (Slobin, 1982; Newport & Meirer, 1984; Gee & Goodhart, 1985).

One interesting study (Maxwell, 1984) examined the acquisition of literacy by a young DD child. It appears that the process is remarkably similar to that followed by mainstream middle class hearing children in our culture (see Heath, 1982, 1983, & 1984 for a description of acquisition of literacy by children in different socio-cultural groups). The child's middle class Deaf father initially used ASL to introduce her to "oral" narrative structures (i.e., "storytelling"), but soon added exposure to English in various forms (e.g. through speechreading, English-based signing, fingerspelling, and print). The child thus learned to read by developing strategies to connect form and meaning through pictures, signs, vocalizations and print. Although this family may not be typical of DD families, the child's acquisition of literacy suggests that with some adjustments for language differences, DD children of middle class families may be provided with experiences similar to those of hearing children from middle class families. These experiences facilitate the DD child's acquisition of English as a

second language by building on ASL as a first language and facilitate the child's acquisition of literacy by bringing the structure and content of stories within the child's grasp.

While in many respects DD children who receive ASL as their primary linguistic input do parallel oral language development, the two situations are not identical. The parents of these second generation deaf children are typically children of hearing parents (Fischer, 1978; Hoffmeister & Wilbur, 1980; Moores, 1982; Newport, 1982; Newport & Meier, 1984; Gee & Goodhart, 1985). In all probability, many of these parents did not begin to acquire a formal language until they began attending a residential school for the deaf at age five or later. Those deaf parents who attended day programs for the deaf or schools for hearing children may not have been exposed to ASL until adolescence or adulthood. They probably vary in the degree to which they have been able to master English in speech or writing (Newport & Meier, 1984). Essentially, they eventually mapped ASL onto earlier gestural communication systems developed in th absence of an adult model (Newport, 1982; Newport & Meier, 1984; Suti & Friel-Patti, 1982; Mohay, 1982). The sign system that they acquired in this manner probably reflected extended nativization. In short, they did not acquire ASL natively in the usual sense -- from their own parents. Furthermore, given the history of deaf education, most of these deaf parents of deaf children attended schools at which no form of signing was used for instructional purposes. Hence, they learned ASL in social contexts from DD peers and deaf adults who worked as dormitory counselors (Moores, 1982; Lane, 1984; Gee & Goodhart, 1985). Certainly, they did not have the opportunity to

observe or use ASL across a comprehensive range of linguistic purposes and functions.

By the time the parents of DD children have become childbearers, they have had the opportunity to acquire ASL through interaction with members of the Deaf Community. Depending on the amount of time they have been exposed to ASL and other community sign varieties, their language has expanded and stabilized to varying degrees (Newport, 1982). Indeed, the degree of complexity that DH individuals develop in ASL over a lifetime and are able to pass on to their DD off-spring gives testimony to what adolescents and adults contribute to language acquisition (Gee & Goodhart, 1985). Clearly, the fact that many deaf individuals attain mastery of ASL later in life challenges popular notions of a critical age for learning a first language.

From a nativization perspective, deaf children of deaf parents (the DD population) are similar to hearing children who receive an extremely expanded and relatively stable pidgin as primary input from their parents (Newport, 1982; Mounty, 1984 a.& b.; Gee & Goodhart, 1985). In the Tok Pisin case, for example, the pidgin was used strictly as a second language for an extended period of time before a shift in social conditions due to urbanization resulted in its use as a primary means of communication by intimates with diverse language backgrounds (Muhlhauser, 1980). Children who creolize an expanded pidgin can draw more generalizations from the input and will have less need to rely on their own biological capacity for language than children who receive a new and less stable pidgin as primary input. However, they do innovate to a far greater extent than children who

have native language input for first language acquisition (Gee & Goodhart, 1985). There is a need for studies of DD language acquisition which compare the second generation to their own parents. The extent to which their signing is similar to and different from that of their own parents and whether the children tend to use more recursive morphology could then be observed. Furthermore, given the tendency for DD children to surpass DH peers in English development (Moores, 1982), one could ask how increased access to English (presumably primarily through print) might affect the variety of ASL used in this population. Unquestionably, then, DD parents would provide a very different kind of input to their own deaf children than the one they themselves received. If DD children produce a third generation of deaf individuals, the variety of ASL used by these children may reflect yet further denativization. Given the high incidence of linguistic variabilty in the deaf population and the differing degrees of English and ASL used in various deaf families (Brasel & Quigley, 1977; Goodhart, 1984; Gee & Goodhart, 1985), cross generational comparisons should be made in the form of descriptive studies of single families.

Goodhart (1984) compared the acquisition of verb agreement and morphologically productive signing by DD and DH children from similar educational backgrounds (schools for the deaf which practiced "total communication") and found that, up to about age seven, there was a high degree of individual variation in both populations with respect to the use of these processes. For the most part, by age nine, the DD, but not the DH, subjects had mastered these ASL subsystems. As an example of the sort of variation that she found in the younger

children, we can consider the fact that two of Goodhart's DH subjects (in the 5-6 year old age range) more closely resembled the DD children than their DH peers. One of these children is a subject in the current study. In the present study, motivated by Goodhart's findings, the possible bases for individual variation in the DH population are examined. The possible interaction of parental input, other sources of linguistic input, and the child's biological capacity is examined, and one of the questions explored is whether DH children ultimately "catch up" to their DD peers in ASL development.

Although Goodhart found that DD children more consistently use verb agreement and morphological PRODUCTIVITY in their signing, she did find that DH children, exposed primarily to English-based signing, also use these ASL-like grammatical processes. Similar observations have been made by other researchers investigating language acquisition in the DH population (Suti & Friel-Patti, 1982; Livingston, 1983; Strong, 1985).

1.6 Deaf of Hearing Language Acquisition

In the most extreme cases of DH language acquisition, the child derives little or no benefit from oral language input and has no exposure to any form of signing. A series of studies carried out by a team of researchers in Philadelphia and later Chicago (Feldman, Goldin-Meadow & Gleitman, 1978; Goldin-Meadow, 1979, 1982; Goldin-Meadow & Mylander, 1984) focused on a population of profoundly deaf preschoolers who attended oral day programs for the deaf and had hearing parents who did not sign. It is not clear to what extent

they had contact with each other and older deaf children in situations where gestural communication may have been either sanctioned or ignored. Nor is it clear that they had no contact with deaf children of deaf parents. In any case, their primary input was oral and they appeared not to derive much if any benefit from it.

These children developed esoteric gestural systems by which they expressed basic semantic relations -- systems which the authors claim had the property of syntactic recursion. While the parents may have unknowingly used some of the gestures with the children prior to the children using them, the essential point is that the parents and children naturally negotiated a language - like communication system that was functional to some extent. The claim that these naturally innovated sign systems have referential power has been challenged (Volterra, 1981; Bates & Volterra, 1984). Nonetheless, the initial language development of these children and those studied by other researchers (for example, Mohay, 1982; Scroggs, 1981; Von Tetzchner, 1984) supports the notion of extended nativization and offers evidence that at least some aspects of language development are not dependent on input. Other features of language, do, however, appear to be more intricately tied to input and these are phonological, lexical and morphosyntactic in nature (Mohay, 1982). Thus, it would seem that DH children exposed to some form of signed input would have greater opportunity to develop these features.

DH children exposed to one or more of the pedagogical systems for representing English on the hands develop ASL-like features in their signing even before they are exposed to any ASL models (Hoffmeister & Goodhart, 1978; Suti & Friel-Patti, 1982). They would

appear to be acting upon the input to make it fit Slobin's (1981, 1983) charges that all languages must be quick, clear, and processible in real time. In short, the children apply nativization processes to the input to make it more accessible (Schlesinger, 1978; Suti & Friel-Patti, 1982; Livingston, 1983; Strong, 1985). Specifically, the children produce signs which are inflected for aspect, use classifiers, and incorporate several notions into one sign. These forms reflect the morphological complexity present in natural sign languages but not invented English-based systems. Similarly, they make use of space, directionality, linguistic & extra-linguistic facial expressions, and body shifting. Word formation rules characteristic of ASL and other natural sign languages are applied, and the children use word ordering strategies, such as topic fronting, which are found in ASL but not in English (Livingston, 1983). They also use classifiers and inflect base signs to denote verbal agreement and aspect. DH children develop these ASL-like processes and features in a sequence commensurate with ASL acquisition, but not necessarily as early as DD children (Suti & Friel-Patti, 1982; Livingston, 1983; Goodhart, 1984; Strong, 1985).

DH children attending programs for the deaf such as those in which the above studies were conducted are exposed to a tremendous variety of signed (as well as spoken and written) input. The fact that their development seems biased in the direction of ASL (Goodhart, 1984; Gee & Goodhart, 1985) would suggest that nativization operates on variable input in this manner. In time, DH children do develop English-like features in their signing, but it seems that at any given stage of development, they are capable of

more sophisticated morphosyntactic, lexical, and discourse performance in ASL than in English (Livingston, 1983; Goodhart & Finnegan, 1985 & Goodhart, personal communication).

Environments in which the child is exposed to ASL seem to be facilitative of the natural course of language acquisition generally taken by deaf children (Schlesinger, 1978; Erting, 1981, 1985; Strong, 1985). It seems that ASL maps onto the biological capacity for language and is best suited to the language acquisition process of most deaf individuals -- an important observation for the design of bilingually-focused "total communication" programs for deaf children (Suti & Friel-Patti, 1982; Livingston, 1983; Goodhart, 1984; Strong, 1985).

1.7 Conclusions

Nativization provides a useful framework for studying both the formation of ASL as community language among American Deaf people and for understanding individual language acquisition in both the DD and DH populations. While ASL is in many ways similar to spoken creoles, it is distinguished from them by its complex inflectional morphology. Deaf children acquiring a signed language appear to be biased by nativization to develop inflectional morphology whether or not they are exposed to ASL. Once exposed to ASL, DH children appear to favor it over other forms of language input -- for sociolinguistic and biologically motivated reasons.

The next chapter will describe the approach taken in gathering the data of the present study. It is a study which explores the possible bases for individual variation in deaf children's language

development. It examines evidence of nativization in two DH children and takes into account environmental variables which interact with nativization processes.

Chapter Two

Approach & Rationale

2.1 Introduction

Recent research has confirmed what some people in deaf education have known for some time: there is a great deal of individual variation in the language development of deaf children, of both deaf and hearing parents (Newport, 1982; Goodhart, 1984; Gee & Goodhart, 1985; Strong, 1985; Livingston, 1983; Mayberry & Fischer,1985; Newport & Meier, 1984). This fact obviously limits the usefulness of large scale quantitative studies designed to examine the language development of deaf children. What is called for, then, is careful linguistic studies of the language of individual children at various stages, and the sorts of input these children may receive at various times of their lives. Such studies can lead to a better understanding of the many sources of individual variation.

These kind of studies should eventually be backed up with a wide range of additional types of studies, including statistical studies of large corpora. At the same time, it should be kept in mind that frequency of occurrence is not always a reliable guide to the character of a linguistic system. Structures that occur only rarely in a corpus may still be well controlled and central parts of a child's (or adult's) linguistic system (Gee & Goodhart, 1985). For example, forms (words or signs) built up by the recursive application of two or more morphological rules may constitute only a small percentage of the total signs in a corpus, but their occurrence

at all (provided we can be sure the child realizes the form is productive) has been argued to be one diagnostic of "deaf of deaf"-like ASL acquisition in deaf children (Newport, 1982; Newport & Meier, 1984; Goodhart, 1984; Bellugi & Klima, 1985) and true creolization in children acquiring/constructing (oral language) creoles across the world (Bickerton, 1975, 1981, 1983; Muhlhauser, 1980; Andersen, 1983). One researcher who recently examined the emergence of morphological recursion as one indicator of ASL development in deaf children is Wendy Goodhart.

Goodhart (1984) studied the acquisition of morphosyntactic complexity in sign language by both DD (deaf children of Deaf parents) and DH (deaf children of hearing parents). She examined three different age groups: 3-4 year olds, 5-6 year olds, and 7-9 year olds. Both populations of deaf children in Goodhart's study exhibited considerable individual variation in the amount of morphosyntactic complexity they produced in their sign language through age seven. At that point, the variability within each group decreased substantially, but the two groups diverged. The DD subjects, as group, uniformly used morphological complexity and used it to a substantially greater degree than the DH group. Within the DH group, however, a few of the children produced a much higher percentage of morphologically complex forms than the others.

Goodhart's subjects were selected from the student bodies of several schools for the deaf which have total communication programs. Two DH children from one of the schools were at almost extreme opposite ends of the spectrum in terms of the morphosyntactic complexity of their signing despite their having had similar

educational experiences. In the interest of obtaining some insight into possible sources of individual variation among deaf children acquiring sign language, further study of these two children (hereafter called M. and L.) was undertaken. Section 2. below summarizes Goodhart's study and describes how M. and L. were developing at that time in comparison with her other subjects.

2.2 Goodhart (1984)

Goodhart compared deaf children of deaf parents (DD) and deaf children of hearing parents (DH) in terms of several specific grammatical features present in their developing sign language. The features counted by Goodhart were: agreement, productive verbs with marked handshapes, and English-based prepositions. Two of these features, agreement and productive verbs with marked handshapes, were presumed to be indicators of morpho-syntactic complexity in visual-gestural-spatial languages such as ASL (Gee & Kegl, 1982; Klima & Bellugi, 1979; Padden, 1983; Newport & Meier, 1984; Supalla, 1982; Supalla & Newport, 1978).

Handshapes which are unmarked occur most frequently in the language and are those learned earliest by deaf children acquiring ASL. More marked handshapes occur less frequently and are acquired later (Baker & Cokely, 1980). Productive verbs are complex forms which convey notions of motion or location while simultaneously conveying information about the object or entity that is in motion or is situated at a particular location. For example, to express the notion of a rock falling, a signer would choose a handshape or

classifier that represents large round-ish objects. If, alternatively, the signer wishes to represent a person falling or stack of paper falling, different classifiers would be chosen. To show how the rock falls from a mountain top to the ground, the signer would move the classifier for large-round-objects along a path in space from a high plane to a lower plane. If the signer specifies that the rock originates at a particular location (e.g., a mountain top), there is source agreement in performing this action. If the signer further specifies that the plane to which the rock falls is the ground, there is also goal agreement in the formation of this complex verb.

Productive verbs and agreement are processes which allow the signer to pack multiple layers of information into one complex sign. In order to be clear and processible in real time, sign languages must infuse levels of meaning into each sign produced (Gee & Goodhart, 1985). The third feature (English-based prepositions) was considered to be more characteristic of invented, non-natural English-based systems because, in ASL, prepositional or locative notions are incorporated into verbs. The invented sign systems do not infuse layers of meaning into each sign but rather present information sequentially, one morpheme at a time -- much like English.

L. & M., the subjects in the present study, were in the 5-6 year year old DH group in Goodhart's (1984) study. Goodhart paired off her subjects and asked them to tell a story to each other. L. & M. formed a pair because they were approximately the same age, both had hearing parents and school records indicated that they had

similar cognitive ability. Both children in each pair watched the stimulus tape, a "Roadrunner" cartoon, and then each in turn immediately re-told the story to the other. These re-tellings were video-taped and eventually transcribed in a system based on the work of Gee & Kegl (1982). The three target features -- verbs showing agreement; productive verbs made with marked handshapes; English-based prepositions were counted for each child. The number of tokens of each feature divided by the total number of verbs in the transcript yielded a percentage for the presence of that feature in each child's corpus.

In comparing her DD and DH subjects, Goodhart found that for the youngest and middle (3-4 and 5-6 year olds) age groups there were no significant group differences in percentages of target features present in their signing. However, the two populations of 7-9 year olds were significantly different from each other in that the signing of the DD group was much more morphosyntactically complex than that of the DH group. Another very important finding of the Goodhart study was that, up to age seven, there were marked individual differences among subjects within both groups. M. and L. were at almost opposite ends of the spectrum in terms of the morphological complexity of their signing despite similar hearing losses and cognitive levels, and identical educational backgrounds. L.'s signing was much like that of the oldest DD children in the study, while M.'s signing looked like that of the youngest DH children. Table 2.1 shows Goodhart's findings for the 5-6 and 7-9 year olds.

Table 2.1*

Goodhart's (1984) findings for (5-6) & (7-9) DH & DD groups
Percentages of target features for individual subjects and groups

Subjects	Agreement	Productive Verbs with marked handshape	Prepositions
DD subjects			
(ages 5-6)			
006	77.4%	71.0%	6.5%
007	7.7%	23.1%	0%
009	92.0%	76.0%	0%
group ave.	59.0%	56.6%	2.2
(ages 7-9)			
011	76.2%	85.7%	0%
012	76.0%	88.0%	0%
013	83.8%	97.3%	0%
015	89.5%	92.1%	0%
group ave.	81.4%	90.8%	0%
DH subjects			
(ages 5-6)			
106	93.3%	86.7%	0%
107	50.0%	41.7%	8.3%
108 (L.)	82.1%	85.7%	7.1%
109 (M.)	13.3%	13.3%	13.3%
110	45.0%	52.4%	9.5%
group ave.	56.7%	56%	7.6%
(ages 7-9)			
115	47.4%	52.4%	0%
114	47.4%	57.9%	21.1%
113	28.6%	50.0%	14.3%
112	29.0%	50.0%	14.3%
111	54.5%	68.2%	4.5%
group ave.	41.8%	45.2%	10.8%

(*Data provided courtesy of Wendy Goodhart, Ed.D., 4/1/86.)

Table 2.1. indicates that L.'s percentages for agreement and productive verbs with marked handshapes were extremely high, while he used a low percentage of English-based prepositions. This suggests that he had a high level of productivity and complexity in his sign language. He looked more like Goodhart's older DD subjects than the other DH subjects (only one of the other DH subjects -- # 106 also had a high percentage of agreement and productive verbs with marked handshapes while having a low percentage of prepositions). It seems that L.'s signing at age five was more characteristic of ASL than English-based sign, as was true of the DD population.

By contrast, M.'s percentages for agreement and productive verbs formed with marked handshapes were low for her group and her use of English-based prepositions was high for her group. At the time of the Goodhart study, her signing appeared to be characteristic of English-based sign, showing minimal productivity or morphological complexity. Thus, according to Goodhart's findings, M. and L. were remarkably different in their patterns of language development, with M. using a primarily English-based system, and L. operating in a signing mode much more characteristic of ASL, similar to DD children acquiring ASL from their Deaf parents.

Given the high degree of variability among children in each group, it is not possible to make longitudinal predictions of patterns of language development for specific individuals. On the basis of the information reported by Goodhart, one could not predict, for example, whether M. and L. would continue to look drastically different from each other with maturity, or whether M. would eventually acquire increased morphosyntactic complexity in her

signing. To answer this question, this researcher examined the sign language used by L. and M., when they were three years older, for the same target features that Goodhart studied. This constituted the longitudinal follow-up component in the present study.

2.3 The Longitudinal Follow-up

The procedure for the longitudinal component of this study was identical to that used by Goodhart. Assisting the investigator was Bonnie Hughes-Nover, the same individual who assisted Goodhart (1984). She is a Deaf adult who has Deaf parents and is an educator of the deaf. Ms. Nover accompanied the investigator to L. and M.'s school where she directed the children in the completion of the required tasks.

The investigator met the children at their classroom and brought them to another room where Ms. Nover explained to them what they were expected to do. M. and L. each watched the same "Roadrunner" cartoon that they had watched for Goodhart and took turns re-telling the story to each other. The re-tellings were video-taped by a hearing research assistant (since Goodhart, who is hearing and signs, had operated the video equipment in her study, a hearing signer operated the equipment in the present study).

The tapes of the children were initially transcribed by a Deaf linguist in a system which will be described shortly. The investigator who is partially deaf and fluent in ASL, then converted these transcripts into Gee and Kegl notation with the assistance of Emily Dexter, who had assisted in the transcription of Goodhart's

data, and the assistance of Dr. Goodhart herself, and counted the three target features using the identical criteria set up by Goodhart. The outcome of this longitudinal follow-up analysis will be discussed in Chapter 4.

2.4 Extension of Goodhart's Paradigm to Additional Conditions

In order to observe each child's use of Goodhart's target features under different conditions, L. and M. repeated the "Roadrunner" retelling task under three additional conditions. L. and M. retold the story to a DD adult, a DH adult, and a hearing signer. They were permitted, if they so chose, to review the cartoon between conditions. Only the child doing the re-telling, the person to whom s/he was re-telling the story to, and the research assistant operating the equipment were present during the videotaping of each condition.

Each child's mother viewed and retold the same "Roadrunner" story twice, once to her own child and once to the DD adult. The rationale for selecting these conditions was to elicit the most ASL-like signing available in each mother's repertoire and to determine whether adult and child audiences would elicit different registers or signing styles from the mothers.

Preliminary data analysis indicated the necessity of obtaining additional data from M.'s mother. A second session was arranged several months after the original data collection. At that time, M.'s mother repeated the task and retold the story to another DD adult.

The mothers' re-tellings were transcribed and analyzed to observe possible effects of parental input on each child's sign language development and are discussed in the light of ethnographic information about each family in Chapter 3.

2.5 Additional Data

Additional data was collected which was not formally transcribed but which was utilized to support or clarify the "Roadrunner" data in describing the children's linguistic repertoires.

1. The children were filmed while engaged in free conversational discourse with each other. To obtain this information, the camera was left running and no other persons were present in the room.

2. The mothers were filmed engaged in conversation with their children about everyday topics, such as what they'd done in school and what the family would have for dinner that evening. This was done immediately following the mothers' signing of the "Roadrunner" story to their children.

2.6 Transcription

All of the "Roadrunner" data in all conditions for both the children and their mothers was then transcribed by Hartmut Teuber, a Deaf linguist, in a system combining the principles and symbols of Stokoe (1960, 1972, 1978) with additional notation describing key aspects of location and motion such as are focused upon in the Gee

and Kegl (1982) perspective. The kind of information noted in these transcripts includes:

1. perspective: first person (role play), or third person (narrator)

2. location of action

3. path of action: e.g., source, goal

4. manner in which action occurred: e.g., tumbling motion, repeated bouncing, etc.

5. classifier(s): classifiers were identified and described and it was noted whether a classifier was perseverated (maintained at a designated location) over more than one sign segment

6. non-manual markers: e.g., adverbial notions shown on the face

7. use of MIME or other NONCANNONICAL means of conveying propositional content

The investigator checked these transcripts by repeated viewings of the tapes and sought the consultation of Bonnie Hughes-Nover, the DD research associate who had assisted in the data collection, Benjamin Bahan, a DD graduate student who has had extensive training in linguistics, and several additional DD and DH adult signers when there were questions about specific segments of the transcripts. The additional sign data mentioned earlier was transcribed by the investigator as needed.

2.7 Analysis Of The Data

A qualitative/descriptive analysis was applied to the data in order to obtain insights into each child's linguistic repertoire in

sign and to observe possible family influences on their sign language repertoires. The data were organized so that it would be possible to make comparisons of each subject telling the story under the different conditions (i.e. to different people) and to compare the subjects to each other and the mothers to the children.

The investigator first wrote an English gloss of the cartoon which was checked with several hearing and deaf adults who also viewed the cartoon. The cartoon gloss was then segmented into scenes and propositions which were used in two ways. First, the transcripts of each child and mother re-telling the story to various people were re-organized according to these story segments. Second, the tapes were repeatedly viewed by the investigator and several Deaf consultants using this segmentation as a framework. Some aspects of signing noted in the comparisons of subjects across conditions and different subjects with each other were the following:

1. presence/absence of Goodhart's target features

2. use of facial expression and body positioning for both linguistic and extra-linguistic purposes

3. stylistic differences for each subject in different conditions (e.g., child-child, adult-child, hearing-deaf, etc.)

4. over-all discourse/narrative style and use of specific discourse/narrative strategies (e.g., role play)

5. use of English-based features such as English function words, initialized signs, quantifiers, conjunctions, etc.

6. use of fingerspelling

7. use of ASL features such as directionality, topicalization, bracketing, modification to show verbal aspect

The acquisition of a language within a particular community usually entails adopting certain values, behaviors and attitudes shared by members of that community (Hymes, 1974; Wong-Fillmore, 1979). ASL acquisition and use marks group identity in the Deaf Community (Padden & Markowicz, 1975; Markowicz & Woodward, 1975; Erting & Woodward, 1979). However, DH children are faced with the dilemma of choosing between the Hearing cultural values of their parents, and the cultural values of their peers and Deaf adults with whom they interact in school. Since L. & M. appeared to be following different paths in their development of grammatical aspects associated with ASL at the time of Goodhart's study, it seemed that they might also be taking different paths in their identification with the Deaf Community. In order to gain insight into these sociolinguistic factors, a variety of people, both deaf and hearing, who have had various degrees of exposure to and involvement with the Deaf Community and ASL, were interviewed by the investigator. The people interviewed were asked to explain what characterizes someone whom they might identify as being strongly Deaf in terms of communication style, behavior, values, etc.. Responses to this question along with the ethnographic information gathered during family interviews helped to clarify various factors that might have differentially influenced L. & M.'s acquisition of ASL and which, in a more general sense, might affect deaf children's language development and contribute to individual differences among children.

2.8 Summary: Purpose of this Study

Goodhart's paradigm was replicated to allow this investigator to observe what changes had occurred in L. & M.'s grammatical development in the three years since the Goodhart study. This was done by checking the presence of Goodhart's target features in the new data. In order to obtain a more comprehensive picture of each child's linguistic repertoire, the paradigm was extended so that the children told the same story to a DD adult, a DH adult, and a Hearing adult who signs. The mothers of the two children were also asked to re-tell the cartoon story used in the Goodhart study so that certain aspects of the mothers' and children's language could be compared. Additional data was obtained of both the children and the mothers engaged in informal conversational discourse to further increase the opportunity of observing the full range of forms and styles available to each person being studied. Ethnographic information was obtained from the parents of L. & M. and from other persons interviewed by the investigator so that the data could be analyzed from a sociolinguistic perspective.

Taken together, it was hoped that the various analyses applied to all of the data collected might emerge as a description of possible sources of individual variation in language acquisition among DH children, and suggest possible courses that future quantitative studies of deaf children's language development might take. A descriptive analysis of each mother's signing and each family scenario is presented in Chapter 3. Chapter 3 thus provides

an ethnographic framework for the description of each child's linguistic repertoire in Chapter 4.

Chapter Three

Ethnographic Factors Influencing Language Development In Deaf Children

3.1 Introduction: The Special Conditions Surrounding Deaf Children's Acquisition of Language

The study of language acquisition by deaf children provides an unique opportunity for examining the interaction of environmental input and the human biological capacity for language. Both deaf children of deaf parents (DD) and deaf children of hearing parents (DH) are exposed to varied linguistic input at home and in school. Some sorts of environmental input are likely to be more accessible to the deaf child than others and some deaf children will be more fortunate than others in having more accessible input to draw from.

Depending on the child's ability to utilize whatever hearing he or she has and to develop speechreading skills, spoken English input will be available to some degree. Other types of language input may include more than one variety of American Sign Language (ASL) and several varieties of signing that are English-based. These English-based forms include invented pedagogical sign systems such as LOVE (Wampler,1971), SEE I (Anthony, 1971), SEE II (Gustason, Pfetzing, & Zawolkow, 1972) and Signed English (Bornstein et al, 1975), sometimes collectively referred to as MCE (Kannapell, 1982) and signing which involves the use of ASL signs in English word order without the addition of special signs to represent English inflectional morphology, function words, and tense or aspect markers. The latter type of signing has sometimes been referred to as Pidgin Sign English

or PSE (Wilbur, 1979; Baker and Cokely, 1980) and is apt to be either more ASL-like or more English-like depending on whether the signer is Deaf or Hearing and other variables operating in a particular communication context. Furthermore, English in printed form will be present to varying degrees in each child's situation since families with deaf children have different values, practices and attitudes with respect to print and the development of literacy. For each deaf child the ability to learn English through reading will at least in part hinge on how much of a language base he has in sign and the ability of his caretakers to use the child's language base to make books accessible. In all situations, the deaf child, like any child, creatively processes linguistic input. Yet, the deaf child is more likely than children typically acquiring a first language to fall back on his biological capacity as he innovates forms and modifies the input so that he may have a more complete linguistic system. Nativization, as described in Chapter 1, plays an unique role in the acquisition of language by deaf children and will be briefly summarized here.

Whereas all language learners undergo nativization, that process of initially constructing a linguistic system that is somewhat distinct from the external target language (Andersen, 1983), deaf children appear to nativize to a greater degree than is typical (Livingston, 1983; Suty & Friel-Patti, 1982). Both DD and DH children seem to continue to generate linguistic forms that are not present in their input even beyond the early stages of language development (Gee & Goodhart, 1985). The extension of nativization is necessitated by the child's inability to utilize the input, either

because it is inaccessible, or because it is insufficient for all the functions for which he must use language.

In deaf children's language acquisition, as in the acquisition of creoles as first languages by children of pidgin-speaking parents, the process of denativization is blocked. That is, to some extent, the environmental target language is either inaccessible or inadequate. What distinguishes the conditions under which particular deaf children acquire language is the degree to which the input is inadequate or unavailable. This affects the amount of innovation which the deaf child must introduce. While, in reality, each deaf child is unique in his ability to utilize different types of language experiences and while in fact, the exact types of available input are different for each child, it is possible to describe several scenarios which typify the conditions under which deaf children acquire language. The reader is referred to Appendix II. for a detailed description of four hypothetical scenarios which are only briefly summarized here. The families of the children in this study will be described in light of these scenarios.

The scenarios depict the acquisition of language by children both prelingually and profoundly deaf, incapable of understanding speech under most conditions. That is, even with amplification provided from an early age, these children generally would not acquire English as a first language through natural interaction with native speakers. Children with less severe hearing losses also lack complete access to an auditorially based language and to some extent will encounter experiences similar to those of a profoundly deaf child in each of the scenarios. The four scenarios are: the deaf

child of Deaf parents who use ASL as their primary language, the deaf child of hearing parents who ascribe to the oralist philosophy, the deaf child of hearing parents who strictly adhere to an English-based sign system in communicating with him, and the deaf child of hearing parents who use both ASL-based sign and English-based sign in their communication with him.

The present chapter has a dual purpose. One goal of the chapter is to describe the different sociolinguistic factors that have influenced the language development of two deaf children of hearing families. The other function served by this chapter is to discuss the evidence of nativization in the input (i.e., the mothers' signing). Comparisons will be made between the mothers' and the children's signing to illuminate the particular shape that nativization appears to take in the acquisition of sign language for either first or second language learners.

3.2 Characteristics of L.'s and M.'s Families

L. and M.' s families are both mixtures of Scenarios III and IV, yet are ethnographically different from each other in many respects. Each child's milieu will be described with emphasis placed on the type of linguistic input associated with each milieu. Thereafter, each mother's signing will be discussed in reference to the ethnographic characteristics of each family.

3.3 Ethnography of M.'s Family

M. was identified as profoundly deaf at the age of 16 months. She is the middle child in a family of three and has two brothers, an older brother who is hearing and a younger brother who was also born profoundly deaf. The family lives in a large Eastern city and many relatives live nearby. The father is a skilled laborer and the mother was a full-time homemaker but now does paraprofessional work at the school attended by her two deaf children. Both parents are high school graduates. They value home and family life over outside concerns and are very attentive to the needs of each of their three offspring.

When M. was identified, the staff at an early intervention clinic of a local hospital for children advised the family to adopt a "total communication" approach. The parents were exposed to English-based sign from the professionals at the clinic. The first language therapist who worked with M. and her family used a pedagogical English-based system. Initially, the input to this family involved signs from the SEE II and signed English systems (Goodhart, personal communication). About a year later, professionals and Deaf adults who used ASL became involved with and brought changes to this early intervention program. Then, as part of the program offered by the clinic, Deaf adults visited the family's home on a weekly basis for a ten week period. Through interaction with these individuals, the family had exposure to ASL. The parents decided to continue using English-based sign as input to M. in the home. Despite her limited hearing, the parents believed that she could acquire English as a first language and hoped that she would develop speech with some

measure of intelligibility. Consequently, they were determined that the use of sign be facilitative of M.'s acquisition of English and consistently tried to represent English on the hands in their communication with her, believing that this approach would support their goals.

To this end, the parents exclusively used English word order and, initially, an English-based pedagogical signing system. For the most part, the signs in this system are based on the ASL frozen lexicon but have been changed with the intent of providing more information about English. A common realization of this change is the initialization of signs where the handshape of the original ASL sign is replaced by a handshape from the manual alphabet that represents the first letter of the English word being represented by that sign in the system. There are many more marked handshapes in pedagogical systems than in ASL and other natural sign languages as a result of processes such as initialization. Thus, in linguistic terms these systems are "less natural" than ASL, and possibly harder to acquire.

M.'s parents also initially used separate signs for all of the English functors and sign markers for English morphological markers (e.g. for tense, aspect, number, form-class derivations). In this approach, one sign represents all of the meanings of a single word. Thus, "to run a race," "run a meeting," and a "run in the stocking' would all be expressed using the same sign.

At first, M.'s parents adhered strictly to the use of English word order plus simultaneous speech and preferred the invented English-based lexicon used with all of the markers and functor signs.

In time, they began to use many more conceptually based signs to represent particular English meanings. Thus, different signs would be used to indicate different meanings of "run". In a similar vein, these parents began to use signs for more basic English words while simultaneously saying a more sophisticated English word having a synonymous meaning. So, for example, the word "correct" might be said on the lips while making the sign for "right." Eventually, the parents began to be less consistent in their use of sign markers and began to use ASL-like inflection when expressing such notions as verbal aspect or plurality. To some extent, they have also incorporated such ASL elements as inflecting signs for directionality (e.g. "I give to you." versus "You give to me."), use of space for referencing, etc.

Apparently, these changes have not been consciously arrived at by the parents. They do not perceive that they use ASL with their children. While they are aware that the way that they sign has changed over the years, they are not sure why the changes have occurred. At one point, they told this investigator that, since M. has clearly become somewhat skilled in English, they were less concerned about consistently representing through sign. They are not sure if the changes are "good" (i.e., in the children's best interests).

M.'s parents are committed to signing at all times when their deaf children are present, wanting very much for them to be included in all family interactions. The transformation in M.'s parents' signing style reflects years of interacting with their children and of the family's regular exposure to Deaf adult signers. The parents

also are aware that their two deaf children communicate very differently with each other than with the hearing members of the family. They do report observing how effective M. is at explaining things to her little brother. In fact, it seems reasonable to suggest that they have unconsciously incorporated some of M.'s signing into their own communication with their younger deaf child. During a home visit, this investigator observed the parents' signing with the younger child and noted their incorporation of ASL processes such as the use of space, directionality, and topic fronting. At times they did not use their voice while signing with him.

At the school that M. and her brother attend, the hearing staff generally use ASL-based signs in English word order and use either signs or fingerspelling for some English function words. The ASL signs are selected for their conceptual correlation with the English words but there isn't a sign-for-word correspondence. In addition, many ASL features such as those previously described are routinely incorporated. This is a substantially different approach from the system which M.'s parents originally were taught and encouraged to use with her. Undoubtedly, the way sign language is used in the children's school has affected the parents' signing style, both from the parents' direct observations of it during visits and indirectly through its effect on the children's signing.

In spite of the natural changes which have come about in their signing, the parents' attitudes towards ASL, English, deafness, etc. and their perception of their role in their children's lives have remained relatively constant. These parents correlate education with opportunity and want their three children to be educated, including

attending college if they so desire. The parents expect and encourage their children to maintain good grades, complete homework assignments, read for leisure as well for purposes of obtaining information. They especially believe in the importance of higher education for deaf children since some non-college vocations may not be feasible options for deaf workers. They further believe that a more educated deaf person will be more prepared to compete in the larger hearing society, overcome prejudices which will inevitably confront him and, hopefully have a better chance of getting ahead in life.

M.'s parents see the development of good English skills as being central to their children's educational success and to later vocational success as well. They accept that their children are exposed to ASL in school, but feel that they as hearing parents have the task of being good models of English. In fact, they indicated to the investigator a belief that the children would learn ASL "on their own" (i.e., did not need to be taught it) from deaf peers and adults. The parents communicated an awareness that ASL development might also be related to something innately present in the deaf child. This shows that they are very intuned with their children's learning and communication strategies. Philosophically, however, they take the view that English-based sign should be used by hearing parents during the deaf child's early years and that as the child matures, ASL can be used more.

The fact that M.'s parents have not placed ASL on a par with English does not signify a lack of respect for Deaf people. Indeed, the parents came into contact with deaf professionals and Deaf

Community people early in M.'s life. They are grateful for the experience and have continued to participate in Deaf Community events geared towards families with deaf children. M.'s mother works in the school lunchroom and assists in many school related activities. The very fact that these parents chose to place their children in a school for the deaf rather than a mainstream program is indicative of their conviction that the children need a deaf environment. Yet, they are still in the process of developing an understanding of their children's membership in the Deaf Community. For example, when asked to describe what she thinks a "really Deaf" person is (in the cultural, behavioral sense), M.'s mother admitted that although she doesn't perceive her daughter M. to be "really Deaf," she senses on a deeper level that she is (or will someday be). Indeed, with her mother M. seems to be less "Deaf" than she is with other Deaf people. When communicating with her mother she uses primarily English-based sign with speech and seems to restrict herself to a smaller signing space, using less body movement and fewer facial expressions. With deaf people she seems to use many more ASL features in her signing, including those which are non-manual.

Scenario III parents place a premium on English and do not see ASL as playing a central role in their deaf children's language development whereas Scenario IV parents see ASL as being more accessible as a first language, value both languages equally, and believe that English will be acquired as a second language by their deaf children. Although M.'s parents respect Deaf people and recognize that ASL is used within the Deaf Community, in their preference for English-based sign as primary input for their deaf

children, they are a Scenario III family. The attitudes, values and priorities exemplified by parents in that scenario are reflected in M.'s mother's signing in the present study.

3.4 Analysis of M.'s Mother's Signing

3.4.1 Introduction

M.'s mother, K., was extremely nervous about signing in front of the camera, a new experience for her. Furthermore, she was very apprehensive about signing with the DD Deaf adult whom she did not know. K. is aware that ASL is the preferred language of many deaf adults and of the Deaf Community and she perceives her own ASL skills to be weak. She was afraid of not being understood, of not being able to understand the Deaf adult, and of being perceived as a poor signer.

On the day of the original data collection, K. signed the "Roadrunner" story under two conditions, first to the DD adult, and then to M.. K. was somewhat more relaxed in telling the story to M. than to the DD adult, but although her version to M. was somewhat more extensive, it really didn't provide more information. She did not show or re-create the actual events or actions of this particular episode of the "Roadrunner" cartoon series. Rather, she explained the on-going conflict between the roadrunner and the coyote: The coyote is always scheming to catch, kill and eat the roadrunner but the quick and clever roadrunner always out-wits the coyote. In essence, K. summarized or told about the story instead of re-telling the story. The data collected in this session does provided useful

information about K.'s signing and over-all style of communicating. However, her rendition of the "Roadrunner" story couldn't be analyzed by examining specific segments of the story as was done with the data obtained from the two children and the other mother.

Immediately following the re-telling of the "Roadrunner" cartoon in this first session, K. and M. were video-taped while engaged in informal conversation. K. was more relaxed at that point and her signing was smoother and more natural. However, so that K. could have a second opportunity to complete the "Roadrunner" re-telling task, a second video-taping session took place several months later.

At this time, K. was asked to view and re-tell the same "Roadrunner" cartoon to another DD adult (hereafter, DD adult #2) whom she'd known for several years and was very comfortable with. The investigator explained to K. that she was to try to re-count the actual events that occur in the cartoon. Although K. was no less nervous about signing than she was during the first session, she was now more clear about what was expected of her. With this clarification, K. was able to respond to the task differently. However, she had difficulty remembering the cartoon. She was also filmed engaging in informal conversation with her two deaf children immediately after the telling the cartoon story to DD adult #2. During both segments of the session, in effort to put K. more at ease, the camera was set up to run on its own so that no persons were present other than those being filmed. Additional data was successfully obtained under these conditions.

Analysis of the data collected during both sessions is merged in the following discussion and examples are presented to illustrate key aspects of K.'s signing.

3.4.2 Characteristics of K.'s Signing

In K.'s narrative style, as in the grammatical structure of her signing, the effects on M.'s narrative style can be seen. Except for a brief switching into role play when she is the coyote saying "GULP" as he realizes he's going to fall, K. tells the story totally from the narrator's perspective, as M. did in Goodhart's study. K. strings together the events with frequent assertions of AND-THEN, saying, "and then," but signing only THEN, much as M. does. This is a very English-like strategy. K. and M. are also similar in their tendency to sign from a high plane near the face. Frequently while signing the "Roadrunner" story in this session, K. slaps both hands on her lap, and this is something that M. also does. Both Mother and daughter seem to do this when pausing or to convey an emotive or emphatic response to an event in the story.

K. did not make direct eye contact with either the DD adult or M. during the first "Roadrunner" re-telling session. By avoiding eye contact, she did not invite feedback or assistance from either of them, either verbally or non-verbally, and did not check to see that she was understood. M. did not intervene to make suggestions or corrections or request clarification during this time. Thus, any opportunity for K. to learn more ASL from M. was missed. In

contrast, K. sought assistance and feedback from DD adult #2 during the second session.

DD adult #2 used voice and mostly English word order with K., prodding her along and trying to put her at ease. By contrast, in the first session the other DD adult used no voice and provided no cues. K. seems more comfortable with Deaf people who use speech and sign than she is with Deaf people who prefer not to use speech. K. was hesitant initially, moved along more easily in the middle of the story, and then forgot the end. When she was stuck, she said/signed that she'd forgotten what happened next in the cartoon and asked DD adult #2 to cue her.

For the most part, K.'s signing style is consistent. She maintains English word order, using primarily ASL signs, and generally speaks while signing. For each concept relayed through simultaneous communication, K. tends to say more than she signs so that, at times, the signs seem to supplement her speech. Sometimes, K. says things the way she signs them. Thus, when she sustains or repeats a sign to show that some action is on-going, she repeats the word, even though if one were speaking English in absence of sign, this would probably not occur (eg., chase, chase, chase). K. chooses signs which convey, as closely as possible, the same concept as her spoken English words -- for example, she will make the sign PITY as she says "the poor wolf." Occasionally she uses a fingerspelled sign (e.g., S-O, which is used in ASL for the English word, "so"). Occasionally, K. incorporates signs and elements from one of the invented English-based systems. While she doesn't use sign system markers for tense, or aspect, she does use the "-ER-" marker that

converts verbs to nouns denoting persons. For example, in signing "roadrunner," the "-ER-" sign affix is added to the sign for "run" to form the sign for "runner," resulting in RUN + ER. K. is very expressive and her facial expressions give her deaf children information about K.'s mood or intent.

K. uses some figurative English expressions, for example: "give up," "bury alive." Shortly after K. says that the coyote is "buried alive," M. asks if he is dead, showing that she has tried to understand the meaning of the idiom from the context. K. responds, "Well.., no, not really." This exchange suggests that K. uses figurative English with M. and that M. may come to understand these expressions with repeated exposure. However it may be that English expressions are not deliberately "taught" to M. (e.g., through use of ASL or real-world examples) . This would be in keeping with the parents' belief that it is possible for M. to learn English as a first language by being in an environment where it is spoken in conjunction with English-based sign. Indeed, in some communities, it is thought that children acquire specific language skills through deliberate instruction. In other communities language is used with children in particular contexts and it is thought that the children will learn from exposure and experience how to communicate in similar contexts (Heath, 1983).

During the first session, in chatting about what they will do when they leave M.'s school and return home for the evening, K. and M. generally both use English word order with simultaneous speech and conceptually based signs. For example, in discussing M.'s plan to

write an account of the "Roadrunner" cartoon that evening after dinner,

K. signs:

ex.1
WHILE IT NEW IN YOUR MIND
while saying: while its still fresh in your mind (write it)

Both of them use an informal conversational discourse style. This means that they don't necessarily produce full sentences, which would be appropriate for written communication but possibly stilted and awkward in face-to-face interaction. Thus, instead of saying to M., "There is not too much time before dinner," K. simultaneously signs and says:

ex.2
NOT TOO-MUCH TIME BEFORE DINNER

M. sometimes uses ASL with her mother. For example, she asks "What's for dinner," by both saying and signing the word "dinner" and using the ASL facial expression for questions (which conveys the notion of "what"), thus:

ex.3
Q
DINNER

During their informal chat, both mother and daughter insert humorous comments. M. asks her mother if the chicken (which was used to make the soup) got away while dinner was being prepared. When K.

sees that M.'s hair has been doused with glitter, she remarks, in sign and speech with a questioning and ironic facial expression :

ex.4

Q (facial expression of "whew!")
NO GLUE,RIGHT / THANK-GOD

K. also uses occasional ASL expressions during this conversation. In her actual communication with her own children, she seems to use more ASL than was indicated during the re-telling task. It seems that K.'s fear in re-telling the "Roadrunner" cartoon may have resulted in a limited representation of her ability to use ASL. She uses for example, the ASL sign/expression "DO-DO" (What will you do?) as follows:

ex.5

Q
DO-DO AFTER DINNER AND AFTER YOU WRITE

However, K. does not use the expression with ASL syntax, where "DO-DO" would likely be preceded by a reference to eating dinner and writing, and where instead of using the sign AFTER, the sign FINISH would be used to mark completion as follows:

Q
EAT FINISH, WRITE FINISH, DO-DO

What K.'s incorporation of the expression "DO-DO" into an essentially English-based question does is allow her, once again to avoid using a more formal style as for example in:

"What will you do after you eat dinner and finish writing?"

Furthermore, not only is the ASL expression more pragmatically appropriate, but, by using such a phrase with her daughter, K. essentially is giving validation to ASL by communicating in a way that M. is comfortable with. The addition of ASL expressions to K.'s signing repertoire is indicative of M.'s parents' increasing acceptance of ASL and Deaf culture as part of their children's lives. It may, in part, explain M.'s enhanced ASL development over the recent few years. K. uses some ASL when she re-tells the "Roadrunner" story to DD adult #2. For example, she uses an ASL idiom while role playing the coyote who realizes he'll fall again.

ex.6

GULP

This sign is formed by drawing the hand into an "S" handshape at the throat, indicating in this context that one is caught in a hapless situation.

K. has incorporated such ASL grammatical influences into her signing style as sustaining or repeating a sign to show aspect. Using this process, she conveys the idea that the coyote is always trying to catch the roadrunner by repeatedly chasing and habitually following him.

When K. explains that part of the story where the coyote puts on suction cups which then adhere to blocks on the ceiling, she uses several ASL grammatical devices. She uses directionality, pulling the classifier representing the coyote towards her chest to show that the suction pulls the coyote to the ceiling:

ex.7

To do this she uses a bent V handshape, presumably to represent the coyote hanging from the tunnel ceiling, and draws her hand into her own chest as she says the word "suction."

In the same utterance, K. uses reduplication to show plurality. She uses a pedagogical English-based sign for "blocks" (two L-shaped hands making contact at the thumbs) but chooses an ASL process as opposed to adding a sign system affix (-S-) to make it plural.

At the end of the story, K. combines ASL influences with English-based signing. Here she first shows how a ledge breaks and falls to ground with the coyote standing on it. Then she explains that rock toppling from above falls on the coyote's head. The signed and spoken portions of K.'s rendition of this segment are as follows:

ex.8

She places a "by-legs" CL at a high plane in front of her to represent the coyote's body and has it turn over as it falls. Then she uses two G-hands circling downward to sign GO-DOWN. K. then signs YES,YES, then uses the two handed C-CL for LARGE-ROUND-SOLID-OBJECT and moves this sign along the same path from a high place downwards to show that something falls and signs, using citation signs -- RIGHT (as in "right" or "wrong") ON WOLF

While K. signs this, she says, simultaneously:

"and then (unclear) just came down, down, down, down and of course it landed right on the coyote"

K. modifies the direction of the sign for "go" to incorporate the notion "to go down." Several classifiers are used: the by-legs CL for representing the coyote as an animate being moving on legs, and the classifier for large round solid objects represents the rock which falls on the coyote. She productively signs the notion of "coyote falling down" by having the by-legs CL represent the coyote and fall from a high plane. She then adds a separate sign to express the notion of "going down," possibly because she doesn't know or doesn't trust that the previous complex sign has included this notion. Similarly, the classifier used for the large rock incorporates the notion of "fall," or "fall and land on" but K. also signs the separate sign for "on." In the present study, M. sometimes does this sort of thing, but less often than her mother.

These transformations in K.'s signing may be indications of nativization operating in adult (second) language acquisition. It could be that certain grammatical devices, found in natural sign languages, are universals which arise from innate principles. By infusing certain ASL-like features into her English-based system, K. gains increased speed and efficiency when producing signed utterances. Although these kinds of changes in K.s signing may, in part, reflect her children's influence they also constitute a difference in the input she now provides for her children.

In the opening scene of the cartoon, the coyote chases the roadrunner to an arc-shaped bridge. K. signs this segment to DD

adult #2 much as M. signed it to L. in the Goodhart (1984) study. Neither K. nor M. at age six used a morphologically productive strategy in this context.

ex.9

> Using English-based signs, K. explains that the coyote has been chasing the roadrunner and now the roadrunner goes to hang upside down on what she calls a bridge. To show this, K. signs GO (two G-hands in alternatingly circling forward in citation format), then places an inverted by-legs CL under a flat B hand, palm facing down (thus,in actuality, she starts by showing the coyote hanging "upside down"). She then inverts the whole configuration as a single unit, ending up with the citation form of "to stand," . M., at age six, started by forming the citation sign, "to stand," and then inverting the configuration to an "upside down" orientation.

In order to convey the notion of "upside down on the bridge" using morphologically complex ASL signs, one would have to first analyze the "by-legs" classifier into its component parts and then move the parts separately to show the notions of animals walking up the arc and hanging from the top. Neither M. at age six, nor her mother at the time of the data collection for the current study, had the productivity to do so. By turning the unanalyzed configuration upside down as a unit, the signer cannot show that the coyote reverses his direction by walking up to the ceiling and further implies that the ceiling also reverses location. These sorts of frozen forms do not present concepts clearly and as input to a deaf child do not provide information about the building blocks of ASL. M. has gone beyond her input as evidenced in the way she signs the same segment to L. in the present study.

ex.10

> M. first holds the by-legs CL in an upright position and then moves it along what appears to be a perceptually supported mental image of an arc until it's in an upside-down position. Next she forms a sign for "tunnel" using two C-CL hands that inscribe the shape of an arc by moving outwards and down from a center starting point. Then she repeats the by-legs CL showing the coyote walking upside down.

The fact that M. now can express this notion productively suggests that language learners follow a developmental process which moves in the direction of natural sign languages even when the original primary input is a sign system based on an oral language. That both M. and L.'s mothers seem also to progress towards increased morphosyntactic complexity in their signing, becoming increasingly ASL-like, despite their different beliefs about the merits of English-based systems, is evidence of nativization. It gives support to the contention that natural sign languages are indeed structured to be maximally clear and processible and that nativization operates on invented systems to make them more like natural sign languages and thus more effective for signers.

One segment of the "Roadrunner" story which K. only briefly recounts in her re-telling is that scene where the defeated and disgruntled coyote lies on the ground planning his next scheme to catch the roadrunner. She does not show the coyote in the process of thinking what to do. What she does is use her strategy of summarizing what happened instead of describing the activity. K. first states that the coyote thinks of something else to do and then says that he gets suction blocks. Interestingly, M. at age six

omitted this section of the story entirely. Furthermore, it is role played by both child subjects in the current study, as well as the Deaf adults who provided a basis for the investigator's determination of target forms. The fact that signers who have access to ASL prefer to role play this idea unit, and that K. in this study and M. in the Goodhart study omitted it entirely, suggests that it may be difficult to express in an English-based system. The use of role play in ASL narrative discourse appears to be a preferred and effective way of conveying characters' internal perceptions. This scene may exemplify certain types of notions which deaf children may have difficulty processing or producing if they are operating exclusively within an English-based system.

K.'s trend towards incorporating more natural sign language features in her signing style is perhaps most evident when she is with her own children in a conversational situation. She uses quiet voice, sometimes no voice at all. She particularly seems to drop her voice with her younger deaf child, N. who doesn't use voice consistently and, sometimes, also doesn't use lip movements. An example of this style is described below.

ex.11

> In asking N. to sit down, K. signs without voice, using reduplication of the sign for "sit" to mean "chair," and by pointing to the specific chair that she means.

She then proceeds to explain to the children about her recent session with DD adult #2, whom they both know as an instructor in their school, and re-plays the dialogue, taking both her own part and

that of the Deaf adult. Thus, it may be that K. uses role play more in naturalistic contexts than her re-telling of the cartoon suggests. The discussion leads to other topics and we see a distinct difference in the way K. signs to each of the two children. For example, in discussing what they had for lunch in school that day, she first turns to M..

ex.12a.

> Using English-based citation signs, K. signs WHAT, EAT, and LUNCH while saying, "What did you eat for lunch?

K. uses English syntax with M., seemingly expecting M. to lipread the parts of the question that are not signed. Assuming that little N. has been watching her exchange with M., K. then turns to him and, focusing on the notion of "same," uses ASL-like strategies to find out whether he ate what M. did for lunch.

ex. 12b.

> K. uses the ASL sign for "same" which is the Y-handshape, first pointing the pinky finger of the Y-hand at N., then bending the hand to point the thumb of the hand towards M. She signs YOU SAME, EAT SAME, LUNCH SAME, maintaining her brows raised in a questioning expression throughout. What she mouths without using voice is: same? (pause) eat the same for lunch?

It seems that K.'s ability and willingness to use ASL with N. allows her to focus on key concepts with him and communicate in a manner that is appropriate for his conceptual level. In directing questions to N., K. often (ex. 13, 14 below) uses an ASL focusing

device called bracketing which involves stating a key element and then repeating it at the end of the utterance (see Kegl in Wilbur, 1979). While using bracketing, K. simultaneously says the same thing that she signs. It may be that K.'s expanded sign repertoire with increased incorporation of ASL influences allows her to use a particular style with N. akin to "baby talk" or "motherese," as Deaf mothers have been found to do (Kantor, 1982 a.,b.; Bellugi & Klima, 1985). It is not unusual to see hearing parents and teachers using this sort of style during simultaneous communication with deaf children, maintaining the grammar of ASL is both modalities and facilitating the child's comprehension. The examples below illustrate this approach. In Example 13, K. asks N. about caring for their dog, and in Example 14, she asks him to explain to M. why his nails are polished.

ex.13

> While maintaining a questioning facial expression, K. asks N. in simultaneous speech and sign, "Who help (-ed spoken but not signed) with Sandy, who help(-ed spoken but not signed)?

ex.14

> K. points to N.'s nails, signing (without using her voice) FOR-FOR, which is an ASL sign used in asking "why" questions and then saying and signing Why? Tell M. why.

It seems that K. uses ASL expressions with N. because she knows he will understand them and then (not necessarily consciously) adds the English to either reinforce what she's already said for clarity or for the purpose of exposing him to English structures and

vocabulary. This communication tactic is a kind of code-mixing which this investigator has observed parents and teachers using to expose deaf children to both ASL and English. It can be a deliberate technique, but, at times it seems to be an unconscious response to the child's needs. In the re-telling of the "Roadrunner" story to M., K. did not appear to use English expressions as an instructive strategy. If, in fact she does do so more with N., it may be because she has seen someone else, either a professional or M., do this with him. If, indeed, K. takes a different approach to facilitating N.'s language acquisition than she did with M., his input would have a markedly different shape to it. Her English-based sign has been affected by nativization processes and she has acquired increased skill in ASL. Consequently, K. now has a more expansive repertoire to work with, and a greater command of stylistic variation.

3.5 Conclusions about M.'s Family

This family, a blend of Scenarios III and IV, is representative of hearing families with deaf children who were born in the early to middle seventies as "total communication" was gaining ground over "oralism." Their increasing acceptance of ASL and Deaf Culture also reflects the changing times and growing public awareness. However, they are somewhat extraordinary in the amount of time and energy they have put into learning to sign, and in insuring that their children's educational and social needs are met.

K.'s signing reflects the values that she and her husband share not only about deafness and sign language but also about how children develop language. It also embodies changes that have resulted from experience and nativization. The effects of parental input at different points in time can also be inferred by comparing the signing of K. and M..

We see certain aspects of K.'s signing which are reminiscent of her daughter's signing at an earlier stage of ASL acquisition and also some stylistic tendencies which are shared by them still. K.'s signing seems to reflect both nativization in adult second language acquisition, as well as the influence of her own deaf children and the Deaf adults whom she knows. In time, hearing parents and their deaf children become locked in a cyclic interaction such that it is no longer possible to know who initiated which of the forms present in their shared communication system. This interaction is observed between L. and his mother as well.

K.'s use of English with M. suggests a belief, on the parents' part, that M. will learn and understand English if she is exposed to it through simultaneous speech and sign. They do not seem use the conversational arena to explain about English through sign. Similarly, M. does not seem to take it upon herself to provide K. with feedback about her signing, thus she also does not take on the role of "teaching" her parents ASL. K. seems to sign differently with N.. This may be because he is younger, or because she has watched how M. communicates with him. Very likely, K.'s observations of how N.'s teachers interact with him has also influenced her style of interacting with him. K., over time, may be changing her

culturally determined ways of interacting with the children to meet their specific needs as deaf children in a hearing family.

3.6 Ethnography of L.'s Family

L. lives with his mother in a suburban apartment complex just outside of the city where M.'s family lives. L.'s mother comes from an urban middle class background. She holds graduate degrees and taught for many years before L.'s birth. She has two adult children from a previous marriage. L.'s father is also professionally educated. L.'s parents separated when he was quite young and his mother has always been his primary caretaker.

L.'s deafness was diagnosed when he was eighteen months old and the family immediately became involved in the same early intervention program as M.'s family. When L.'s mother saw how positively L. responded to visual forms of communication, she agreed to learn sign language. Like M.'s parents, she was exposed to both English-based sign and ASL. However, L. is almost a year younger than M. and by the time his family entered the program, the emphasis on invented, pedagogical sign systems had decreased. L.'s mother decided early-on to use ASL as well as English-based sign with him. She is unusual in that her own training in the study of languages enabled her to soon appreciate the benefits of ASL, a natural language, over other forms of signing as input for her young deaf son.

L.'s mother became very involved with Deaf people shortly after L.'s identification and believed that they could help her understand her son and his needs. She saw Deaf people as a linguistically and

culturally different group because of her interest in other cultures and languages. L.'s mother's early acceptance of the central role that ASL and the Deaf Community would play in her son's social development allowed him to discover his identity as a Deaf person at a very young age. Because of this acceptance, L. has always been free to accept Deaf role models and utilize ASL linguistic input.

L.'s mother feels that ASL and English are equally important for her deaf son and has been a strong advocate for bilingual education for all deaf children. She has operated on the premise that ASL would be the basis of L.'s early language acquisition and that English would essentially be acquired as a second language. This assumption has shaped the way she has communicated with L. over the years and the way their communication has changed with his maturation.

Their somewhat unique way of interacting has facilitated not only his comprehensive language acquisition but also her acquisition of ASL. Undoubtedly, her approach draws on her experiences in teaching languages. In essence, L.'s mother has let him be the "expert" on ASL/sign language from the time he was a tot and has retained her right to be the "expert" on English. It seems that, by communicating her respect and appreciation for ASL, she has motivated his interest in meeting the challenge of learning English.

From the time she first began learning ASL, L.'s mother has incorporated whatever she knew about that language in her communication with him. For example, having learned that reduplication of a sign is a way to show plurality, she would apply that strategy in her signing with L. to expose him to the contrast

between one-of-something and more-than-one-of-something. Likewise, knowing how difficult English is for deaf people to master, she has gone to great lengths to make it as accessible to L. as possible. To a large extent, L.'s mother's particular way of signing has provided L. with input containing many essential elements of both ASL and English. She uses ASL signs and morphological modifications, choosing English word order at times and ASL word order at other times. L.'s mother's tendency to vary her style is desirable (rather than confusing) because it allows her to pursue a range of communication goals with L. She uses ASL to introduce or expose L. to new information or ideas and uses more of an English style of signing when the context is familiar and she wants to expose him to English vocabulary, expressions, or sentence structures. She uses fingerspelling to present new English vocabulary and explains concepts underlying the English through ASL. When L. was younger, his mother developed a technique of altering the tenseness or laxness in her arms, hands, and facial muscles to match the pitch and loudness of her voice when she was using speech and sign simultaneously (Goodhart, 1980). This enabled her to focus on particular parts of utterances and to model elements of English that might not be otherwise available to a deaf child. While L.'s mother has not assigned high priority to his development of speech, she has been committed to helping him become literate in English.

Language and literacy are of paramount importance to L.'s mother and she has strived to insure that L. would have access to the world of books despite his deafness. She has read to him daily since he was two and has both consciously and unconsciously used face to

face communication to expose him to forms of English generally associated with literary uses. She tends to use elaboration freely in both narrative and conversational discourse, frequently using analogy and providing detailed explanations of cause/effect factors related to the topic of the discourse. L.'s mother is very metalinguistically astute and has taught him to use language to discuss language. This unusual home orientation may be facilitating his ability to make use of a variety of input sources and aiding his ASL-English bilingual development.

L.'s home situation is also somewhat unique because his mother has become professionally involved in deafness, thus giving him added access to Deaf professionals and the experiences afforded by such interactions. He has essentially been reared in a Scenario IV environment.

3.7 Analysis of L.'s Mother's Signing

3.7.1 Introduction

L.'s mother was filmed re-telling the "Roadrunner" cartoon in two conditions: to the DD adult and to L.. She also was taped engaged in informal conversation with L.. All of the data was collected in one session. For L.'s mother, D., the experience of being video-taped was not a new one. Since L. was approximately two years old, mother and son have periodically been video-taped by researchers studying L.'s language development. In both conditions, D. had some difficulty recalling all of the events that occurred in

the cartoon episode, but took great pains to vividly recreate the story for her audience, presenting those parts that she did recall in precise detail.

The nature of D.'s interaction with L. throughout the session and the particular ways in which she mixes English-based sign and ASL in her signing style with both the DD adult and L. provide important insights into the kind of language input L. has had from her. Characteristics of both the grammatical and discourse features of D.'s signing style are described and illustrated by examples in the next section.

3.7.2 Characteristics of D.'s Signing

D.'s style of communication includes the use liberal use of facial expression and some use of mime. Like her son L., D. is inclined to elaborate how and why things happen. For example, she explains that the reason the coyote falls is that he doesn't have (the right kind of) claws. Similarly, L. gives a reason for the coyote's falling, saying that it happens because the animal is heavy. As will be discussed shortly, D.'s elaboration with L. seems to be very specific in purpose. D. uses a substantial amount of role play and she uses it for two different yet related reasons. At times she enters the role play mode to re-enact a piece of action that occurred in the cartoon -- to show the audience how something was done or how it happened by becoming the characters who were involved in the event. At other times, D. takes a character's perspective in order to convey to the audience that character's internal perceptions of a

particular experience or problem. D. also has two ways of describing the characters' emotions. Either she shows these feelings on her face and in the way she holds her body, or she simply states the emotions as the narrator, for example, stating that the wolf is really angry (signing: WOLF TRUE ANGRY).

Furthermore, D. also uses pronounced facial expressions to show her own reactions to what happens in the story (e.g. surprise, pity, empathy). D. has an interesting way of using a communication technique akin to role play to bring forth her own thought processes. When she becomes stuck in trying to recall an event in the story, for example, or when reflecting back on what she has just said, D. uses facial expressions and body shifts and "speaks/signs" her own thoughts; essentially "talking to herself" or bringing her own internal thought processes to the surface. For example, when trying to remember something, she says and signs, "UHUH , WHAT HAPPENED NEXT ?"

When describing why the coyote falls, and having just suggested that it is because he doesn't have any claws, she uses this strategy to insert a narrative aside, expressing in sign and speech that maybe the coyote doesn't have the right kind of claws:

WELL, MAYBE NOT THE RIGHT KIND

Some general observations of D. 's story-telling discourse style were are noted in viewing the tapes. Her "Roadrunner" story-openings to the DD adult and L. are very different. To the adult she expresses that "It's a very, very confusing (or complicated) story, I

hope I get it all right." Perhaps she says this to off-set any difficulties the DD adult might have in following D.'s signs or any criticism D. feared this person might have of her ASL. By contrast, her opening to L. is straightforward, suggesting less concern about possible mistakes and more comfort in signing with him than with the Deaf adult. She simply states that she's "...gonna sign a story called "The Roadrunner."

When she gets stuck remembering something during her re-telling to the Deaf adult, D. says/signs to herself "What happened next?" She doesn't make eye contact with the person while doing this and in no way indicates that she wishes to be prompted. This is in contrast to her re-telling to L. in which she very blatantly seeks his input by asking him "What happened next?"

D. demonstrates the ability to perform a range of pragmatic functions through sign (e.g., request clarification or assistance; introduce a topic; indirectly warn the other person that she may not be able to communicate clearly in that context, etc.) and to adjust her style for communicating with children versus adults and intimates versus strangers. This suggests that D. has been able to expose L. to the pragmatic aspects of linguistic communication in a way which has been accessible to him. This contention is supported by evidence, discussed in Chapter 4, of L.'s sophisticated ability to use a range of discourse features and styles.

When signing to the DD adult, D. sometimes reinforces her productive ASL signs with English-based explanations. It may be that she is unsure that her choice of classifiers has resulted in a clear representation of what happened. In the next example, D. tells the

DD adult that it is difficult for the coyote to walk because he has put suction cups on his feet. She chooses a modified 3-handshape. This handshape is used in one of the ASL signs for "walk," and it is also the handshape used in the ASL sign for "awkward." It is plausible that D. chose it in this context to express that idea that, with suction cups on his feet, the coyote finds walking to be both difficult and awkward (personal communication, Robert J. Hoffmeister).

ex. 1

> Each hand assumes a modified 3-hand formation and D. moves her hands forward in a slow, alternating pattern,. The hands a have a cupped shape, suggesting that something (the suction cups) is attached to them.
>
> Then D. uses English-based citation signs and adds:
>
> (it's) VERY HARD TO WALK

D. uses voice differently with L.and the DD adult. The only time she uses voice with the adult is when she announces, "I forgot how it ends!" It may be that she is signalling her inability to continue by switching completely out of an ASL mode into English. D. incorporates voice into her discourse style with L. for the purpose of providing sound effects, for example, the noise the coyote makes when he drops from the ceiling. Possibly she doesn't do this with the DD adult because the person is a stranger, or because it is something that she does in telling stories to children but not adults. In his narrative discourse, L. sometimes uses sound in exactly the manner that his mother does with him. It is as equally possible that D. has unknowingly emulated her son's technique as it

is that L. has developed this idea from observing his mother's story-telling style. A third possibility is that both mother and son have developed close relationships with the same Deaf adults and are reflecting the influence of these individuals in their narrative style.

D. enlists her son's help in the course of re-telling the "Roadrunner" story. When she forgets what happened next she asks him. When he corrects her signs she not only accepts the input but repeats the sequence of discourse incorporating his input. An example is in her re-telling, to the DD adult, that part of the story where the coyote has been hanging from the tunnel ceiling, suction cups attached and now falls to the ground.

ex.2

> D. uses a by-legs classifier to represent the coyote. With her free hand, she bends one finger at time, showing that one leg falls while the other still hangs. D. then signs FALL by dropping the by-legs CL straight down from a high plane to a lower one.

L. shows her a new way to express this same concept. He interrupts and shows the coyote's legs falling separately.

> L. uses two G-CL hands, each G representing one long-thin-object, namely each leg. One G-CL at a time swings out and down.

D. then repeats the sequence, copying him exactly before proceeding with her story.

Initially D. communicated a particular concept, in this case the notion of an animal hanging by it's forelegs then falling from a

high place, using the building blocks of ASL in a productive manner. However, L. shows her how to apply further analysis to the by-legs classifier such that each piece of it can be seen as one leg. If the meaning of the sign is analyzed by the signer, and the signer wishes to show each leg of the animal falling separately, the G-CL would logically replace the by-legs CL. Thus, although D. has effectively communicated the semantic content of this segment, L. seizes the opportunity to give her feedback on her choice of signs. In this way, D. continues to develop her ASL skills. She also gives him a non-verbal message that she respects his language, and that even though she is the mother and he the child, she is not always the one with the "right" or "best" information. Furthermore, by accepting his judgement of which is the most correct or best sign she is validating his burgeoning identity as a Deaf person.

Even as she looks to her son as the key source of input for her own ASL acquisition, as ex. 3 shows, D. uses the story-telling arena as an opportunity to expose L. to English in a naturalistic manner.

ex.3

> D. fingerspells the word C-L-A-W-S, then shows L. the concept by using a claw-shaped 5-hand to represent each claw in sign.
>
> Similarly, she fingerspells the word S-U-C-T-I-O-N, then shows the concept in signs by using two B-hands facing outwards and drawing them into O-hands towards her body.

When engaged in informal dialogue with L., most of D.'s signing is very English-based. She sometimes informally exposes him to complex English syntactic structures through sign, and uses fingerspelling frequently to introduce new vocabulary.

D.'s ability to observe and incorporate L.'s use of signs into their mutual communication system dates back to the time when his language was just beginning to develop. Even before L. had regular interaction with the Deaf Community, he was applying productive rules to his sign input from D. and his language therapist (Hoffmeister & Goodhart,1978; personal communication, Wendy Goodhart). His early signing reflected nativization processes operating on what was initially English-based input. L., not yet three years old, and signing for perhaps a year, combined two signs, "yellow," and "bug" by using the handshape,"Y" for "yellow" instead of the usual "3" handshape for "bug," made the combined sign at the nose, which is the usual location of the sign for "bug" and gave it the movement for "bug" (Hoffmeister & Goodhart, 1978). By incorporating L.'s creative sign "inventions" into the shared home signing system, that system became increasingly accessible to the deaf child and the groundwork was laid for later denativization towards both ASL and English.

While D.'s signing often involves linguistic strategies which would be unacceptable in grammatical ASL, she shows evidence of applying problem solving techniques as she attempts to analyze signs and use them productively to clearly represent the underlying concepts of whatever she is trying to communicate. This approach may have facilitated L.'s acquisition of both ASL and English by encouraging him to experiment with forms and to analyze his input for component parts which could then be used in a productive manner. In analyzing examples of D.'s signing of the "Roadrunner" story, it will be seen that some of the things that she does with her signs neither L. nor a Deaf adult user of ASL would do. In these cases, her use of

signs might be considered ungrammatical in ASL but may be evidence of nativization in progress. The first segment to be discussed is D.'s rendition, to the DD adult of the scene in the cartoon where the coyote has suction cups on and is hanging from the tunnel top, only to become "un-glued," one foot at a time, and fall to the ground.

ex.4

> D. shows the coyote climbing up the tunnel walls using two bent V-hands to show the animal climbing, then sets up the tunnel first by fingerspelling T-U-N-N-E-L, then using a G-CL hand and drawing an arc in the air.

It is unlikely that either L. or a Deaf adult would refer to the tunnel, a three dimensional real-world structure through a two dimensional representation. D. seems to be attempting to represent the tunnel in a gestural-spatial modality, and reinforces it by fingerspelling "tunnel."

In example 5., D. shows the DD adult how rocks from the tunnel ceiling are attached to the coyote's feet, and how the animal falls, one leg at a time, from the tunnel ceiling:

ex.5

> D. first signs ROCK, using the English-based initialized "R" with the right hand making contact on the back of the left hand which is in an "S" shape. Then, she assumes a V with her left hand, which is the by-legs classifier, and uses her right hand, now in a slightly open O and places a rock on each leg.
>
> Next, to show one leg at a time falling, D. uses a by-legs CL to represent the coyote and using her free hand, takes hold of one finger at a time and bends it down.

While this use of the free hand to move the fingers of the by-legs CL might not be the approach chosen by an ASL signer, it indicates that D. has further analyzed the classifier. She knows that the parts must move separately to represent each leg of the animal rather than the whole animal's body, but is not yet sure how to show this. Her attempts to move one leg while leaving the other in place is evidence of nativization. It is similar to a strategy used by one of Goodhart's seven year old DD subjects', who in signing this same segment dropped the index finger of the by-legs CL while leaving the other finger in place. However, unlike D., the child did not use nis free hand to manipulate the perseverating by-legs classifier.

When the animal falls, D. shows that the suction cups come loose and rocks are pulled off the ceiling in the process. In the version to the DD adult, as shown below, D. expresses the notion of suction, but doesn't choose a classifier that clearly represents the rocks.

ex.6

Both hands assume B-CL handshapes, fall straight down and close into O handshapes.

In example 6, D. knows that classifiers must be used, but chooses more general ones rather than precisely representing the objects she is describing. However, D. adds clarity to her representation by using spatial location and agreement to clearly communicate the concepts of suction and pulling. She does this by

changing the handshapes as she she proceeds through a path of movement from source (the tunnel top) to goal (the ground).

Several examples from D.'s signing of the "Roadrunner" cartoon episode provide evidence of nativization. D. uses forms which a Deaf adult signing ASL would probably not use in the same context. For instance, in the next example, she shows how one animal chases the other to a bridge.

ex.7

> D. uses citation signs for "run" and "chase," then uses two by-legs CL hands, each representing one of the two animals to show how they chased each other.

In ASL, signers would not use the by-legs classifiers to show one animal chasing another. They would most likely first establish spatial locations for each animal and indicate its position relative to the other animal so that semantic relations would be clear (i.e., which one was chased and which did the chasing). Then, the sign for "chase," involving A-handshapes on both hands would be used to show the action of chasing. D. uses by-legs CLs to show the chasing in progress, which ASL signers would not be likely to do. However, her choice of classifiers to represent the animals is semantically appropriate and her way of showing how the action occurs (i.e., the path of motion) is accurate. When D. performs analyses of signs on some levels, she generates forms not likely to be used in that context by a Deaf ASL signer. Yet, the fact that she is productive in her use of signs, and the resemblance to ASL supports the nativization argument.

Further evidence of nativization in D.'s signing is indicated when, in the same contexts, she uses strategies similar to some used by M., the other child subject in this study. It seems that D., a hearing adult learning ASL as a second language and M., a DH child acquiring ASL as a first language, may be undergoing similar developmental processes. An example of this is seen in their descriptions of that segment of the cartoon where the coyote and the roadrunner hang from a bridge at the opening of the story.

ex.8

> In signing this to the Deaf adult, D. doesn't use SASS (see glossary) classifiers to set up the bridge and describe its shape. Instead, she suggests the existence of this structure by having by-legs classifiers representing the two animals move one at a time in an arc-shaped path to a high spatial plane. M. signs the segment similarly, using eye gaze to indicate that the animals are positioned in a spatially high plane, then suggesting the presence of the arc shaped structure by moving the by-legs CL hands which represent the animals along an arc-shaped path.

D. makes her signing accessible to L. by incorporating ASL features and processes. Similarly, she has tried to make English literacy more accessible to L.. She does this by structuring her signed narratives such that she exposes L. to the sort of narrative organization typically found in well written stories in our culture. One of the things she does is provide important details in her narrative which will later serve as "old information" to help her audience understand new information. For instance, D. wants to point out to L. that the reason why the coyote fails to hang from the ceiling while the roadrunner succeeds is that the coyote doesn't have

the right kind of claws. To do this, she first shows the roadrunner digging his claws into the ceiling surface, using a bent-V handshape to represent the claws. Then, when the coyote jumps up to hang and promptly crashes to the ground, D. explains that he doesn't have the right kind of claws. L. has developed this technique as well. For example, he provides an elaborate description of the roadrunner in his opening scene to M. By showing how the animal characteristically moves, L. provides a background for understanding less explicit references to the roadrunner's speed which come up later in the narrative.

It has been said that D. uses facial and body movements while signing to convey both segmental and suprasegmental information. In doing so, she provides L. with accessible information in these domains and very likely encourages his ASL development even though her use of these devices may not be representative of conventional ASL forms. D. seems to have a strategy of exaggerating her facial and body movements to emphasize significant real world actions. When the coyote falls from the bridge, D. modifies the citation sign for FALL so that the by-legs CL falls almost to the actual floor of the room, thus indicating that the animal fell far. Similarly, earlier in this segment when she has the animals chasing each other, she bends her whole upper body forward as she signs, to create a stronger sense of movement. At the end of the story, the coyote has fallen through the ground and is now hit by rocks falling from above him. D. shows the path of the rocks' movement by having them fall from a high plane, originally designated by her as the location of a high cliff, towards the actual floor of the room. This tendency to extend

beyond the conventional ASL signing space is yet another piece of evidence for nativization. Young deaf children and hearing adults beginning to acquire sign have been observed to exhibit this tendency to extend the space covered by their movements and incorporate the full body in their signing (Frishberg, 1975; Klima & Bellugi, 1979; Rimor et al, 1984). Similarly, studies of how signs change over time in use by communities of deaf people indicate that signs which were originally formed with large movements are now restricted to smaller areas of space (Woodward, 1978; Lane, 1984; Rimor, et al, 1984). Thus, strategies employed by the individual language learner, whether they be first or second language acquirers, recapitulate the trends seen in the change of sign language over time.

D.'s description of the scene in which a van runs over the coyote highlights several key aspects of her signing which have already been examined: her sophisticated use of role play, evidence of nativization, the functions served by added elaboration in signing to L., and how L.'s correction of D.'s signing furthers D.'s ASL development.

In the version to the DD adult, D. takes the coyote's perspective, then stiffens her body and assumes a frightened and shocked facial expression. This conveys the animal's sudden surprise and fear at seeing the on-coming van. She then shifts into the narrator mode to tell about the van hitting the coyote. To do this, D. makes the sign for "car," makes a local sign for "truck," fingerspells "truck," and then makes the sign for "go" (with two G-hands alternately circling outwards). Next, she repeats the mime/role play, showing the coyote's fear a second time. This is

followed by a return to the narrator mode to explain in detail that the coyote is in this helpless predicament because he has fallen with heavy rocks stuck onto the suction cups. This time D. uses two 5-claw-hands to represent the immobile feet with suction cups attached. D. seems to have ASL signs, non-canonical forms (such as mime & GESTURE), and nativized forms in her repertoire to represent the same concepts. She finishes up the segment with a third return to the role play mode to show the panic-stricken coyote being hit and pushed down.

D. begins telling L. about the van hitting the coyote by explaining at length in the narrator mode how difficult it is for the coyote to move and why he is in this predicament. The added explanation underscores for L. how cause - effect relationships made transparent will clarify meaning in a story. She then enters the role play mode and uses mime plus FORMAL SIGNS to show the coyote standing stiff. Returning to role play, after a brief shift to the narrator mode, D. shows the action of being hit from the character's perspective.

ex.9

> D. signs CAR, using citation form, then, using a 3-CL for vehicle, first moves it towards a by-legs CL representing the coyote, then changes it to an S-CL (round-solid-object) which hits her own chest.

L. stops her at this point to chide her for having the van hit from the front when in fact the wolf is hit from the back in the cartoon. He takes it upon himself to show her how it really happened and does so by standing and using his full-body in role play. L.' s

interruption causes D. to forget her place in the story, but she welcomes the opportunity to learn something and it is this teaching - learning exchange that characterizes much of their interaction.

3.8 Conclusions about L.'s Family

In aspiring to a bilingual/bicultural approach in the rearing of L., D. has created a Scenario IV environment, striving to facilitate his development of both ASL and English and encouraging his positive identification with the Deaf Community. L.'s mother has negotiated an interactive language learning exchange with him which allows her to contribute to her son's linguistic growth while continuing to become skilled in a language which will always be foreign to her. Yet, through this language, she can hope to maintain intimacy with her son throughout his life.

That this approach began early in L.'s childhood is suggested by his advanced ASL development as reported by Goodhart (1984). However, D. is rather atypical of parents in general in that she is an extraordinarily literate individual and has a special interest in all matters connected with language and communication. Because of her ability to communicate with L., their interactive language learning exchange, and her attitudes towards deafness and ASL, L. has developed an exceptional sensitivity towards language related experiences. As will be shown in Chapter 4, he is already a skilled story-teller, has a wide range of discourse styles and highly developed metalinguistic abilities. It is these traits which

distinguish him linguistically from his DH peers at this point in time rather than grammatical knowledge.

3.9 Concluding Discussion

It does seem that environment may make a difference. Such variables as attitudes, values, beliefs and types of communication available to deaf children in their homes in all likelihood influence both ASL and English development. The extent to which DH children are able to utilize other sorts of input, for example the ASL modelled by DD peers and Deaf adults, is likely to be affected by parental attitudes towards ASL and the Deaf Community. Experiences and abilities which are encouraged by a particular parent's interests or orientation are likely to have significant effects on deaf as well as hearing children provided that communication allows the deaf child sufficient access to these experiences (Bodner-Johnson, 1986). Yet, there are still biological constraints on language which operate in a specific manner with respect to sign language acquisition. Consequently, language learners acquiring sign language will utilize input in accordance with this biological blueprint. In fact, the parent and child data in this study suggest that strategies employed by the individual language learner, whether they be first or second language acquirers, recapitulate the trends seen in the change of sign language over time. Thus, environmental influences are counterbalanced by internal norms for language. A particular individual's language development is the product of the two forces interacting in ways that are both predictable and unique.

Chapter Four

Analysis of the Children's Language

4.1 Introduction

The present chapter begins with a discussion of how each child's language has changed since the time of Goodhart's study. This discussion is supported in two ways: First, the presence of Goodhart's target features (productive verbs with marked handshapes, agreement, English-based prepositions) in the new data is compared with the percentages reported by Goodhart. Second, the Goodhart data is discussed from a qualitative/descriptive perspective (e.g. overall observations of each child's morphological development in ASL, use of English-based grammatical and discourse devices, and narrative style/strategies used by each). Thereafter, similarities between the two children's language as observed in the current data are discussed before proceeding to an analysis of what distinguishes them linguistically. The children's developmental trends are viewed within the nativization framework for language acquisition that was delineated in Chapter 1. These trends are also discussed relative to the family variables presented in Chapter 3.

Terms which are frequently used in this chapter while discussing the children's language behavior are defined in Appendix I.

As these terms come up in the chapter, they will be further clarified within the text.

4.2 Over-all Changes In M.'s Language As Indicated By The New Counts

Table 4.1 below shows L. & M.'s percentages for Goodhart's target features at the time of the Goodhart study and again in the present study. In both cases, M. is re-telling the cartoon story to L., her DH peer. A discussion of the changes as indicated by the new counts follows.

Table 4.1
Comparison of percentages of target features for L. and M. in Goodhart (1984) study with percentages of same features in the current study

		productive verbs/ marked handshapes	agreement	English-based prepositions
Goodhart	M.	13.3%	13.3%	13.3%
	L.	85.7%	82.1%	7.1%
Current	M.	48.0%	38.0%	4.0%
	L.	36.0%	28.0%	0.0%

The current percentages as shown in Table 4.1 indicate that M.'s sign language has become more characteristic of ASL, much more productive and morphologically complex. Recall, from the discussion of Goodhart's study in Chapter 2, that M. had the lowest percentage of ASL- related features in her signing of all Goodhart's DH subjects in the 5-6 year old group. Her percentages for agreement and

productive verbs with marked handshapes have now increased substantially and her use of English-based prepositions has decreased markedly. When compared with the 7-9 year old DH group from Goodhart (1984), she is average for agreement and productive/marked categories and has fewer prepositions than average for that group. For use of prepositions, she resembles Goodhart's 7-9 year old DD group. It seems, in terms of ASL development, that M. is "catching up." She is acquiring more features of ASL as she matures and continues to interact with Deaf adults and DD peers.

It is the case, as discussed in Chapter 3, that some factors in M.'s home and family environment have changed, very likely facilitating her ASL development. However, her input at home and school still includes multiple varieties of both ASL and English-based sign. Given the continued availability of English-based sign, M.'s preference for ASL would appear to be related to denativization processes. Clearly, M.'s development suggests that, given time and exposure to ASL input from the Deaf Community, DH youngsters seem to modify their linguistic systems in the direction of ASL.

4.3 Over-all Changes In L.'s Language As Indicated By The New Counts

Table 4.1 above also compares L.'s percentages for Goodhart's features at the time of her study and in his re-telling of the cartoon story to M. in the present study. In contrast to M., L.'s percentages in the agreement and productive/marked handshape categories have sharply declined. In the case of agreement, he is

still within the range for the Goodhart DH 7-9 year old group, but markedly lower than the Goodhart 7-9 year old DD group. For the percentage of productive verbs with marked handshapes, he is lower than the children in either Goodhart's DD or DH 7-9 year old groups. However, he has a count of zero for use of English-based prepositions, making him identical to the DD group in this age range for this category. L.'s counts present a rather perplexing and paradoxical finding. It is not clear what factors would account for the decrease in percentages of ASL features when he was so precocious in his early grammatical development. In observing Goodhart's DH groups (Table 2.1, Chapter 2), a similar decline was observed for the 7-9 year old group compared with the 5-6 year old group for agreement. A leveling-off trend was observed in comparing these two groups for productive verbs with marked handshapes. Consequently, L.'s developmental pattern, in these respects, may not be atypical for the DH population. Nevertheless, it is useful to hypothesize as to why such a pattern occurs for some DH children -- in this case, L..

It may be that L. is expanding the use of earlier acquired ASL grammatical knowledge to cover a greater range of discourse functions and styles. Another possibility is that L. now conveys information using linguistic devices which are not accounted for in the Goodhart paradigm. For example, he may be using mime in the role play mode to express propositions that were not expressed when he told the same story in the Goodhart study. He may express more propositions, but may not use agreement or marked handshapes in doing so. Thus, the increase in propositions would not be accompanied by a proportional

increase in the presence of Goodhart's features. Yet another possible factor which may be affecting L.'s signing is increased access to English through print in a family environment which places a high premium on literacy. Acquisition of literacy is likely to influence an individual's total language repertoire (Heath, 1983). Furthermore, for an individual who uses more than one language, acquisition of literacy in one of the languages possibly affects that individual's linguistic competence across languages and language functions (Grosjean, 1982). Thus, for a deaf person, acquisition of literacy in English may have an impact on the varieties of sign he uses despite the language and modality differences between ASL and English.

To obtain a fuller picture of the changes in the children's language, the tapes from Goodhart's study were reviewed from a descriptive perspective, noting the children's over-all signing styles and discourse techniques.

4.4 A Descriptive Analysis of Characteristics of the Children's Signing at the Time of the Goodhart Study

L. had already acquired a remarkable degree of morphological complexity, using a number of ASL classifiers. He also had begun to incorporate classifiers into verbs of motion and location -- showing several elements of meaning in a morphologically complex sign. When telling a story, he used space to establish the location of specific referents and he used agreement. Already, L. had begun to use role play as a narrative technique that involves taking the character's perspective (signaled by shifting body position, breaking eye contact

with the the listener, changing facial expression and/or assuming the traits which have been attributed to this character earlier in the conversation). Rather than merely re-calling the events of a story, he was beginning to re-create it, using elaboration and detail. It seemed likely that he would continue on this path, maintaining progress in his ASL development at both the grammatical and discourse levels. It is also feasible that L.'s acquisition of literacy further enhances his narrative skill in sign.

M. used primarily English-based sign with simultaneous speech. She had not developed the morphological complexity associated with ASL. Using minimal productivity, M. barely deviated from citation form in her sign.

She seemed to be focusing on recalling the sequence of events as seen on the video-tape and frequently inserted in speech and sign the phrase " and then " as a placeholder when she had difficulty retrieving the next incident. M. did not seem to have digested the story or to have gotten a sense of each character's distinctive traits. Thus, instead of processing and then recounting the episode, M. seemed to mechanically repeat what she saw as best as she could remember. She reported on the coyote's attempt to hang upside down, which occurs twice in the story. No information was given about the coyote's motivation to do this. When he falls, M. did not explain where he falls from or to. Possibly this was all that she remembered of the story, but her frequent hesitations suggested that she remembered more than she could express. Furthermore, in her strict adherence to English-based sign, she seemed constrained in the types of narrative techniques available to her.

The story was delivered entirely from the narrator's perspective; there was no use of role play and in fact little variation in facial expression of any kind. M.'s narrative was devoid of explicitness or detail. She did not describe the setting of the episode or the characters' location or activity within that setting. In fact she mentioned only one of the two characters, the coyote, omitting the roadrunner entirely.

It seems that M. had not developed a means for expressing in English-based sign those notions that L. expressed through use of ASL devices (e.g.: productive signing, role play, spatial agreement). In short, she not only was behind, in comparison with Goodhart's other subjects in her ASL development, but, in fact, seemed constrained in what she could express linguistically by her reliance on English-based sign.

In looking at the Goodhart data, it seems that there were at least two possible directions that M. might, in time, take in her linguistic development. Either her signing would acquire increasing morphological complexity and other ASL characteristics, or she would develop alternative means of expressing complex notions in English-based sign. Furthermore, it seemed reasonable to hypothesize that acquisition of English literacy would help M. develop a clearer sense of narrative structure and style in her signing (Heath, 1983; Grosjean, 1982).

The feature counts in the longitudinal follow-up component of the current study indicate that the paths of M. and L.'s linguistic development have converged somewhat. Each child's linguistic repertoire was then descriptively analyzed three years after the

Goodhart data collection. This descriptive analysis further examined the changes that each child had gone through, and illuminated the similarities and differences between the children.

4.5 L. and M. Three Years Later - A Convergence of Paths with Individual Differences

The two children are now more alike in their linguistic abilities. Tables 4.2 and 4.3 which appear below illustrate the comparisons made between the two children. Given the small number of subjects, the data in these tables was not subjected to statistical analysis. Table 4.2 shows both of the children's use of agreement, productive verbs with marked handshapes, and productive verbs (marked or unmarked handshapes) averaged over all of the conditions in the present study.

Table 4.2

Averages Across Conditions

Percentages of agreement, productive verbs with marked handshapes and productive verbs with either marked or unmarked handshapes averaged across four conditions (Peer, DD, DH, Hearing signer) for each child

	agreement	productive verbs with marked handshapes	productive verbs
M.	31.3%	28.0%	55.5%
L.	34.0%	26.3%	68.5%

These percentages suggest that the children use agreement and productive verbs with marked handshapes to a similar degree when the conditions are not examined separately. However, L. uses a substantially higher percentage of productive verbs, suggesting that his over-all productivity in signing may be greater than M.'s. Thus, it would seem useful to describe how he signs specific segments of the the story in each condition so that the nature of this productivity might be illuminated.

As indicated in Table 4.1, L.'s grammatical development now appears to have levelled-off or plateaued. It seems that he put this aspect of acquisition "on-hold" while focusing on other areas, for example the development of stylistic variation. In their ability to adapt to sociolinguistic differences in their audiences (e.g.: peers versus adults, hearing versus deaf signers, and intimates versus strangers) the two children show some differences. Table 4.3 shows how each of the children uses agreement, and PERSEVERATION of classifiers with the DD adult and Hearing signers. Both of these features have been found to be strong indicators of ASL (Gee & Kegl, 1983; Goodhart, 1984).

Table 4.3

Comparison of each child's use of agreement and perseveration with the DD adult versus the Hearing signer

	Agreement		Perseveration of classifiers over # of signs	
DD adult	L. 43%	M. 28%	L. 5	M. 3.5
Hearing signer	L. 12%	M. 30%	L. 2	M. 2.5

While M. essentially uses agreement equally in both conditions, L. uses substantially more agreement with the DD adult. This suggests that he shifts to a more ASL type of signing in that condition. Both children seem to perseverate classifiers over longer sign stretches with the DD adult than with the hearing signer. However, L. does this to a greater extent than M., suggesting that while she has developed this ASL strategy in her narrative style, he may have a greater sense of when to use it (i.e. -- he is more motivated to shift with Deaf versus hearing audiences). L. 's ability to use different narrative/discourse styles with different receivers will be further illustrated by examples below. It will be shown below that L. seems now to have given broader application to his previously acquired grammatical skills while at the same time acquiring new discourse skills.

As was shown in Table 4.1, M.'s signing has become much more productive, reflecting increased morphological complexity. That is,

she is now more aware that parts of signs carry pieces of information and that these pieces can be structured in particular ways to convey specific meanings. Her development suggests that even when the initial primary input is an English-based sign system, and even when English-based sign continues to be available in the input, DH appear to, in time, transform this input to correspond more closely with the structure of a natural sign language, as characterized by morphological complexity. M.'s modification of her English-based input is indicative of nativization as described in Chapter 1.

M. has developed increased morphological complexity in her signing (Table 4.1), and she has developed a beginning awareness of the constraints that motivate shifts in signing style (Table 4.3). Examples of M.'s signing of specific segments of the story in different conditions will be described below. Some differences will be pointed out in her communication with peers versus adults and intimates versus strangers. It will be shown that she has now acquired the ability to use role play as a narrative device for taking the perspective of a character in a story and conveying that character's internal perceptions of the story 's events.

4.6 Shared Characteristics of the Two Children's Linguistic Strategies

4.6.1 The Children's Style of Communicating with a Peer

When communicating with a peer (i.e. each other), L. is inclined to use a style which is heavily focused in a pragmatic rather than a SYNTACTIC MODE. M. does not consistently style shift

or code switch. However, she also uses this approach in signing specific segments of the story to L. This style of delivery is characterized by intensive use of mime/role play. As explained previously, role play is a form of narrative discourse in which the signer becomes one of the characters, relaying the events of the story from that character's perspective or conveying that character's internal perceptions, thoughts, or emotions. The signer usually signals his entry out of the narrator mode and into the role play mode by subtly breaking eye contact with his audience. Sometimes a body shift accompanies this transition (Baker & Cokely, 1980; Loew, 1984). The signer may assume the traits of several characters during a role played sequence, signaling the character changes by altering body position, or just by adopting the facial expressions associated with that character's personality. Mime/role play involves the use of the full body to convey propositional content along with non-canonical signs or gestures while relaying a story from the perspective of one of the characters.

In the pragmatically oriented peer condition, the children assume the shared knowledge on the part of their audience, are liberal in re-structuring the events of the actual story, and freely interject humorous comments. A discussion of how several segments of the cartoon are signed by each of the children will serve to illustrate this narrative style.

M. to L.

Early in the cartoon, the roadrunner jumps up to hang by his feet from the ceiling of a tunnel. When the coyote jumps up to join him there, the roadrunner jumps down and takes off. M. tells this part of the story to L. by role playing the roadrunner who baits the coyote with a sneering look. M. uses facial expressions to convey the roadrunner's attitude towards the coyote. When signing this same segment to the three adults, she doesn't supply as much affective information.

At a later point in the cartoon, the ledge breaks with the coyote standing on it and falls to the ground. In relaying this to L., M. relies on their shared experience of having watched the cartoon and focuses not on precision in her sign formation, but on the affective aspect of conveying the character's fear about falling.

ex.1 (M. to L.)

> While the coyote is standing on a ledge, the ledge breaks and falls.
>
> M. signs this in the role play mode. To show the notion of falling, she moves a by-legs CL from a high plane (where the ledge would be) to a lower plane (the ground). Then M. quickly makes the signs for "me," "not," and "understand," with the signs running together. Next M. rests her chin on an L-hand, showing the notion of "thinking." Following this, she repeats the notion of the animal falling, this time with the ledge by moving a by-legs Cl backwards onto a B-CL and then dropping the whole construction together. Finally, she stretches her hands out in her body, suggesting the notion of resignation, and then makes the sign, FINISH. As she signs this segment, M. subtly changes her facial expressions to convey the coyote's horror, bewilderment, and finally resignation.

Elsewhere in the story, one of the coyote's feet comes loose after he has been hanging by suction cups from the rocky ceiling of a tunnel.

ex.2 (M. to L.)

> While the coyote is hanging from the tunnel ceiling with suction cups attached to his feet, one foot comes loose and dangles.
>
> M. describes this segment to L. using both forearms and slightly bent-V-CL (or modified by-legs classifiers) handshapes on both hands to show the coyote hanging by its legs from the tunnel ceiling (this classifier is probably not one which Deaf adults would choose in this context and M.'s use of it will be analyzed later in the present chapter). She holds one of her forearms upright in place, to show that one of the coyote's legs remains hanging as the other forearm swings out and down at the elbow to show how the coyote dangles in the cartoon. Later her other forearm falls similarly, and her two bent V-CL hands bump into and tumble over each other as the animal falls.

Although this is not exactly the way the coyote falls in the actual cartoon, it is true that he does appear to be inept and this is what M. is communicating to L.. With the adults, M. does not show the coyote tumbling as he falls. In telling the story to her peer, she seems less concerned with careful choice of form and more interested in elaborating the actions. By doing so, M. seems to be telling L. something about the characters' traits.

L. to M.

In one segment of the cartoon, the coyote, frustrated with his failed efforts to catch the roadrunner, lies on the ground

contemplating yet another strategy. This segment was role played by the DD adult who provided the target form for this (and Goodhart's) study. When L. tells M. about it, he goes a step further and while in the role play mode, uses mime -- almost to the exclusion of signs. L. straddles a chair turned backwards and uses the back of the chair to represent the floor when role playing the coyote performing an action on the floor or orienting eye gaze towards the floor. Throughout this segment, L.'s face maintains an expression of "thinking.":

ex. 3 (L.to M.)

Strategy Segment

> L. stretches his arms out in front of his body to show the coyote lying prone. Then he rests his head on his fist while placing the other hand on his hip to show the animal thinking. He looks at the floor using eye gaze and draws on the floor using his index finger and the back of the chair as the floor. Then he shakes his head while wiping the floor (the chair), looks at his hand as the coyote looking at its claws, and shrugs his shoulders with hands stretched out in front of his body. Right after the shoulder shrug, L. places a C-CL above each shoulder and raises his hands above the shoulders (showing shoulders rising). This is the only canonical sign used in the segment.

This mime/role play is extended over eight units or sign equivalents. By contrast, in Example 4, with the DD adult, with whom he is much less familiar, L. opens the same segment in the narrator mode, giving a brief description of the scene in formal signs before shifting into a role play mode to convey the coyote's thinking processes.

ex.4 (L. to DD adult)

Strategy Segment

L. begins in the narrator mode and signs that the coyote thinks as he lies on the floor. Then L. enters the role play mode and expresses the notion of "draw" two times. First, he expresses it using a G-CL and tracing something neutral space in front of him. Then he uses an I-handshape on a B-CL and makes the citation sign for "draw." Going back to the narrator's perspective, he uses citation signs to express that the drawing occurs on the road. Re-entering the role play mode, he draws an arc and then wipes it off by using the sign for "clean" with one repetition of movement. Still in role play, he puts his head on his fist to show the coyote thinking and looks at his hand as he turns it over (showing the coyote looking at its paw or claw). Then he shrugs his shoulders (as he did with M. but without a signed component).

In contrast to the way this segment is signed to M. (Example 3), in the version to the DD adult (Example 4), L. used seven signs and showed four of the verbal notions in mime form.

In signing another portion of the story (Examples 5 and 6 below), where the coyote is run-over by a van from the rear, L. use of mime/role play with M. is contrasted with his use of role play largely to the exclusion of mime with the hearing signer. One example of what I am calling role play/mime is when, in signing to M. (Example 5), L. stands up and grabs his own legs to show that the coyote is unable to move. The DD adult who provided the target for this study did this also. However, she does it while sitting. Thus, while it is not a sign, and is a non-canonical form, this type of behavior appears to be a strategy used in ASL narrative discourse. To convey the same propositional content to the hearing signer, L. uses signs rather then his own body. This suggests that he may be more likely to use mime/role play (i.e. non-canonical forms and non-

manual ways of conveying propositional content) with Deaf than hearing signers.

ex. 5 (L. to M.)

The coyote gets run over by a van.

L. begins in the role play mode and shows the coyote in a kneeling or semi-standing posture using a bent version of the by-legs CL. Then he turns his upper body to the back to show the coyote looking backwards. He then uses an initialized sign for "van" (a V-handshape on each hand while making the sign for "car") and uses his A-hand instead of his index finger to indicate the location that the van came from. Next, L. takes the narrator's perspective and makes the sign for "know," before re-entering the role play mode to show how the coyote tries to move out of the way of the van. To do this he grabs his own leg with both hands and physically tries to move it, then repeats the motion for the other leg. He is unable to move either leg and then thrusts his body and outstretched arms forward to show the coyote being run over (and flattened). Shifting briefly back into narrator perspective, L. again makes the sign for "know," then, to show the animal being hit from behind, he hits the back of his own head with a flat B-CL hand. Then L. makes the FINISH sign, fingerspells T-O-O, makes the signs for "late," and "then," and shows the coyote lying on the ground by using the citation sign for that. To conclude the segment, L. repeats his expression of the notion of "lying-down-prone" in non-canonical fashion by briefly re-entering the role play mode and stretching his arms out in front of his body.

ex.6 (L. to the Hearing Signer)

The coyote gets run over by a van.

L. opens this segment in the narrator mode, makes the sign for "then," indexes to the right with accompanying eye gaze and then shifts into role play. He shows the coyote's anger and disappointment on his face as he positions a G-CL on either side of his body to represent each leg of the coyote. Using a V-CL for the coyote's eyes, L. moves his hand to the right and back to show the animal seeing the on-coming van. Then, he signs "truck," using a local sign (bent-V drawn across the forehead) and positions an X-hand at each side of his body to represent the legs with suction

cups attached that are stuck to the ground. Re-entering the narrator mode, L. shows the coyote being run over by turning one of the X-hands on its side and slightly modifying the other X-hand (it is difficult to see on the tape whether it fully assumes the vehicle classifier handshape or not) so that it represents the vehicle hitting the coyote from behind.

With M., L. not only favors mime and the role play mode, but elaborates on the events seen in the cartoon, tending to take liberties with what actually occurs. He sometimes alters things for comic effect and interjects humorous comments, for example: saying that the roadrunner is dead, suggesting that an umbrella falls on the coyote's head when in reality no such thing occurs in that episode of the cartoon, or pointing to his own groin when the wolf is left hanging by one leg from the tunnel ceiling (suggesting that this is where the animal hurts most).

4.6.2 The children's Style with the DD adult

An interesting contrast to the children's preference for a pragmatic mode with each other is their tendency with the DD adult to be formal and strive for precision of form. In fact, L., who is perhaps more advanced in this domain of development, seems to operate on a continuum from an informal, pragmatic style with a deaf peer who is an intimate to a formal, syntactic style (Givon, 1979) with the DD adult who was a virtual stranger.

M. to the DD adult

M.'s awareness that she should strive for precision of form with the DD adult is seen in her signing of that segment of the story in which the coyote walks up to the arc-shaped ceiling of the tunnel to hang while suction cups are attached to his feet. For this segment to be clearly conveyed in ASL, appropriate forms must be chosen to convey five essential elements:

1. The tunnel needs to be established at a specific location in space, using a classifier which specifies the actual shape of the tunnel (size and shape specifier or SASS).

2. It is important in setting the scene that the nature of the ceiling's rocky surface be described.

3. If it has not been previously indicated that heavy suction cups are attached to the coyote's paws, this must now be conveyed.

4. The coyote's difficult walk up the tunnel walls must now be shown.

5. Finally, the notion of "hanging" must be conveyed.

Only in the version to the DD adult, shown in Example 7. below, does M. come close to including all of these elements.

ex. 7 (M. to the DD adult)

The coyote walks up to the tunnel ceiling (with suction cups on his feet) and hangs.

Prior to expressing this idea unit to the DD adult, M. explains that the coyote bought SOMETHING CALLED STICKY for the feet (pointing to her own foot) which will cause him to stick (become stuck). She shows the notion of suction by using two C-CL hands, palms facing down, which she alternatingly pulls away from the "ground" located in front of her. Then, she points to her fot and makes the signs for "me (I)," "will," and "try." Next, M. uses two C-CL hands, facing forward, away from the body, in an alternating pulling-away movement, to express the notion of "walk up a wall with suction cups attached." M. then sets

up the arc using two C-CL hands and forming the shape (SASS) of the tunnel. She then perseverates one hand in a C-CL clitic representing the tunnel while she has a by-legs CL walk up the C-CL clitic and then partially drop down to hang. Four elements are expressed in this version, making it the most compositionally complex of the four conditions.

M. fails to convey all of the notions of this complex segment in the other conditions. For example, with L., she has not previously shown the coyote putting on the suction cups or indicated how the coyote would have difficulty walking due to the resistance caused by the cups. It seems that M. suggests to L. that the animal would like to hang from the tunnel (but has previously encountered difficulty in doing so) by signing "I will try (to hang)" in the role play mode as she begins the segment. This conversational approach to conveying information is prevalent in the pragmatic mode. The arc is not established, but by gazing upward (perceptual agreement) and signing at a high plane, in the space where the tunnel ceiling would be, M. suggests its presence. She knows that L. has seen the cartoon many times as she has and therefore may assume that he knows that she is referring to the tunnel. She does not know whether the DD adult has seen the cartoon or if so how familiar she is with it. This assumption of shared knowledge is very characteristic of the pragmatic mode (Givon, 1979). Compare M.'s signing of this segment to L. (Example 8 below) with her rendition of it to the DD adult (Example 7) above:

ex.8 (M. to L.)

The coyote walks up to the tunnel ceiling (with suction cups on his feet) and hangs.

M. gazes upwards (toward ceiling), has left hand form by-legs CL and "walk along" in the path of an arc while she makes the sign for "try" with her right hand. She then makes the signs for "I try," then again "I will try" (signs running together). Then she repeats the movement for "walk along in an arc" with her left hand and repeats the expression of "I will try." All the while she maintains an upward gaze and signs at a high plane. M., then again, moves a by-legs CL in the path of an arc at a high plane to show the animal walking. M. then positions two bent by-leg CLs facing each other at this same high plane to show the notion of "hanging."

Perhaps each bent by-legs CL is supposed to show that there is a block stuck to the coyote's foot, or this handshape may indicate that the coyote's claws grip the ceiling as he hangs. It is not clear from the context provided what M. intended to convey with this handshape.

In signing this segment to the hearing signer (Example 9 below), M. incorporates three essential units of meaning in a single complex sign: that an unspecified arc structure exists, that an animate being exists, that the animate being walks up this structure. However, she fails to clearly establish the specific referents, the tunnel and the coyote:

ex.9 (M. to the Hearing signer)

The coyote walks up to the tunnel ceiling (with suction cups on his feet) and hangs.

M. makes the sign for "walk," then the signs for "see," "try," and "on". Next, one hand is held in a C-CL and the other hand forms a by-legs CL representing an unspecified animate being walking up the inside of this unspecified structure.

When M. describes this part of the cartoon to the DH adult, she does establish the referents, but only after she is well into the segment. For example, she does not assign a specific location for or specifically describe the tunnel early in her narrative. Thus when she uses the C-CL clitic to refer to the tunnel, it is unclear to the naive audience. In going from the hearing adult to the DD adult, we see M. become not only more sophisticated in her use of classifiers, but also more cohesive in her narrative organization. There is thus an increasing concern with precision at both the syntactic and discourse levels.

Another segment of the cartoon conveys the idea that the coyote puts suction cups on his feet. The suction is what will enable him to hang from the tunnel and wait for the roadrunner. In signing this segment (Example 10 below), M. explicitly conveys the notion of suction using complex morphology only in her version to the DD adult:

ex.10 (M. to DD adult)

The coyote has on suction cups.

Using two 5-claw hands which represent the paws with cups attached, M. pulls her hands away from the wall in a slow, alternating motion to create the idea of suction.

By contrast, M. omits this idea unit entirely in her version to L.. Her versions to the DH adult and hearing signer fall somewhere in the middle - she refers vaguely to the sticky quality of the objects by pointing to her foot and forming the signs for "sticky," and "stuck."

L. to the DD adult

The contrast between L.'s pragmatic style with M. and his syntactically precise focus with the DD adult can be seen in his expression of that segment of the cartoon where the coyote, suction cups attached to his feet, has been hanging from the tunnel ceiling and one leg comes loose. The ceiling surface is composed of rock-blocks to which the suction cups attach and when the coyote's foot pulls one of the heavy blocks loose, the animal succumbs to gravity.

In his pragmatically oriented version to M., L. is concerned with conveying the character's perceptions of his experience whereas with the DD adult, he presents the narrator's or audience's view of the situation. Also, L. adds mischievous humor to the story for M. by pointing to his own groin to specify the locus of the coyote's agony, something he would not do with the DD adult.

L.'s use of classifiers in signing this segment to the DD adult (Example 12 below) is similar to those used by both the DD adult who provided the target forms for Goodhart's data analyses, and one of Goodhart's most linguistically sophisticated DD subjects (Example 11 below).

ex.11 (The DD adult & Goodhart's advanced DD subject)

> While the coyote is hanging from the tunnel ceiling with suction cups attached to his feet, one foot comes loose and dangles.

> Modified-open-X-shaped hands with opposed thumbs each represent a block from the ceiling (to which the suction cups are attached. Each forearm represents one of the coyote's legs. To show the coyote falling, the arms fall

forward from the elbow to show how that the-coyote-with-blocks-of-rock-attached-to-his-feet-falls-to-the-ground.

ex.12 (L. to the DD adult)

While the coyote is hanging from the tunnel ceiling with suction cups attached to his feet, one foot comes loose and dangles.

L.'s handshape is slightly different from one used by DD individuals above -- a squared-off-modified-C-with-opposed-thumbs on each hand. That this handshape represents the blocks of rock and the forearm represents the hanging legs of the coyote is indicated by L.'s having "walked-up" to the ceiling with modified 5 or C claw-shaped hands, followed by giving the citation sign for "rock," then moving the C-hands out across the ceiling and modifying their shape by angling the knuckles and finger to indicate: rocks-shaped-like-blocks-are-all-across-this-surface.

Three notions are packed into one sign in L.'s version to the DD adult:

1. The coyote hangs with his legs dangling.

2. The coyote's hands are attached to the ceiling.

3. Rock-blocks from the ceiling are attached to the suction cups on the coyote's paws.

(A fourth notion of heaviness is implicit in showing the force of gravity as the forearm falls in this version.)

That L.'s rendition of this segment is most morphologically complex in the DD adult condition is further illuminated by analyzing the component parts of the sign used in his version to M.

ex.13 (L. to M.)

While the coyote is hanging from the tunnel ceiling with suction cups attached to his feet, one foot comes loose and dangles.

L. uses two G-Classifier hands (G-CL's signify the semantic category of long-thin-objects); each representing one of the coyote's hanging legs. One notion is conveyed in this choice of classifier. L. inserts the (citation) sign for "heavy" several times for M. providing a clue as to why the animal eventually falls. The heaviness concept is also suggested by the bouncing motion that occurs when the coyote hits the ground.

Since L. doesn't represent the ceiling blocks or the suction cups in his choice of classifiers with M. (although he did mention the suction cups earlier), the audience must infer from the story as a whole that the reason why the coyote falls is because his paws are stuck to the heavy blocks of rock. Once again, it appears that L. has relied on M.'s shared familiarity with the cartoon and used more of a pragmatic mode with her -- in contrast to his syntactic strategy with the DD adult. Another example (Example 14 below) which supports L.'s use of maximal morphological complexity with the DD adult is his explanation of the segment in which the ledge breaks and falls to the ground with the coyote standing on it.

ex.14 (L. to the DD adult)

While the coyote is standing on a ledge, the ledge breaks and falls.

L. has represented the ledge using two modified C-shaped hands, one moving out behind the other (and towards L.)to delineate its actual shape. One hand is held or perseverated in this location to continually represent the ledge. Then, with his free hand, L. places a by-legs CL above (but does not quite make contact with) the perseverated hand representing the ledge and both hands move downwards together. The coyote (by-legs CL), goes through the ledge (C-CL) as the two handed configuration

nears the ground, indicating that a hole is formed (in the ground by the ledge).

Multiple themes (nominal notions) are embedded in this complex sign. The ledge is one THEME, the coyote is another, and the hole-in-the-ground becomes yet a third theme. Also involved is perseveration (the one handed C-CL is maintained from the two handed formation of the sign for the ledge) and agreement (the ledge is the source of the movement).

Even though L.'s signing to the DD adult contains many examples of the most morphologically complex style in his repertoire, L. sometimes backs up his productive ASL signs with fingerspelling and citation signs (e.g. the signs for "then," and "other"). He seems to do this, not because he doubts that the sign's compositionality conveys multiple units of meaning, but because code-mixing serves as a discourse strategy which allows him to emphasize or highlight key notions of his narrative (Grosjean, 1982). The DD adult who provided the target form does not use citation signs while signing this episode of the "Roadrunner," but does use fingerspelling to reinforce or specify SASS classifiers in other segments of this episode (e.g. fingerspelling "tunnel" after describing it using SASS classifiers). A DH adult, also taped by this investigator while signing the same cartoon, was observed to have a tendency to use citation forms to reinforce or clarify morphologically productive forms. Thus, there seems to be individual variation in this respect which may or may not be attributable to whether the signer is DH or DD. An example of L.'s use of this strategy is the following:

ex.15 (L. to the DD adult)

The coyote falls from the tunnel ceiling (from which he's been hanging with suction cups attached to his feet.

L. fingerspells O-F-F, drops the forearm forward (using the modified C-CL handshapes described earlier), signs THEN OTHER, again fingerspells O-F-F and drops the other arm forward. He follows this up by having a by-legs CL, representing the whole animal, fall from the surface that represents the ceiling.

4.6.3 The Children's Style with the Hearing Signer

Each in their own way, both children sign differently to the hearing signer than they do to deaf signers. The children may sense that communicative behavior which is appropriate in the Deaf Community may be inappropriate to use with or be misunderstood by hearing signers.

In the examples below, M. seems to indicate an awareness that hearing people do not understand sign language as well as deaf people. She does this by being REDUNDANT, repeating the same content several times. When she is signing these story segments to the hearing signer, either using morphologically complex signs or noncannonical forms, M. is likely to repeat the ideas using citation signs. It seems that she wants to be sure that the hearing signer hasn't missed any subtleties of meaning.

M. to the Hearing Signer

Comparing M.'s description of two segments of the cartoon across conditions reveals the approach she tends to use with the hearing signer. One is the strategy scene, described earlier (Examples 3 & 4) during the discussion of how the children sign to one another, in which the coyote is lying on the ground contemplating his next move. M.'s versions to L. and the DD adult are brief; with L. she relies heavily on facial expression, mime and gesture, whereas with the DD adult she accompanies her facial expressions with signs. Her version to the hearing signer is the longest (eight units long) but her version to the DH adult (six units long) is longer than the versions to either L. or the DD adult (four units each) -- suggesting that she might be starting to respond to each person's hearing status along a continuum. Examples 16 through 19 below summarize how M. signs this segment in each of the four conditions.

ex.16 (M. to the Hearing Signer)

Strategy Segment

M. enters the role play mode (as the coyote) and remains in it throughout. Using a V-CL for "eyes," and gazing upwards, she signs LOOK-AT, then she uses an non-canonical sign/gesture for "think." This is done by placing her chin on an L-hand (thumb and index). She makes citation signs for "idea," and "no," and then signs "think" again as above. Then her face "lights" up (showing the coyote getting a good idea), she signs PERFECT using two F-hands held out in front of her body, palms facing outwards and again signs the citation sign for "idea."

ex.17 (M. to the DH Adult)

Strategy Segment

Maintaining the role play perspective throughout, M. makes the citation sign for "think," and then repeats the proposition using the non-canonical sign or gesture described above (chin resting on L-hand). While making this gesture, her face changes expression several times,

expressing the notion of different thoughts/ideas coming up. Then, she signs the signs ME, KNOW, EAGER and PERFECT (two F-hands as above).

ex.18 (M. to the DD Adult)

Strategy Segment

Maintaining the role play perspective throughout, M. first shows an expression of thinking on her face (the coyote thinking of a good idea). Then she signs the signs for "why," and "not," assimilating the A-handshape of the second sign into the Y-handshape of the first. Last, she makes the citation sign for "idea" and then the sign, PERFECT as above.

ex.19 (M. to L.)

Strategy Segment

Maintaining role play perspective throughout, M. first makes the non-canonical sign or gesture for "think" with her chin the L-hand as in the other conditions, then signs the ASL sign, DO-DO (coyote saying to himself "What am I going to do?"), repeats the "think" gesture, then shows a facial expression of "getting an idea."

In the version to the hearing signer, compared with the other three conditions, M. repeats the same propositional content several times, and is most inclined to reinforce her facial expressions and gestures with signs. It seems that this may be a kind of "Foreigner Talk" (see Andersen, 1983 for various perspectives on Foreigner Talk) in which the native speaker of a language adapts his input to a new learner of the language in the interest of facilitating communication between them. There are different opinions on whether the modification of input facilitates the learner's acquisition of that target language, but there seems to be a general consensus that it is a compromise negotiated between those who wish to communicate at a

given point in time. M., in this case seems particularly inclined to use a kind of "Foreigner Talk" with hearing signers characterized by redundant propositions whereas L.'s approach is more one of simplification.

Another segment which M. elaborates for the hearing signer is one in which the frightened coyote jumps onto a ledge to get out of the way of a huge rolling boulder. M's version to the hearing signer (Example 20, below) is her longest, and she uses English-based citation signs to reinforce her facial expressions. She doesn't use citation forms to express this segment in other conditions.

ex.20 (M. to the Hearing Signer)

The coyote jumps on a ledge to avoid a rolling boulder.

M. gazes up at the location of the mountain while role playing the coyote and seeing something there (a rolling boulder), a look of panic comes across her face. Maintaining this facial expression as she remains in the role play mode, M. uses English-based sign (citation forms and an initialized version of WAY) to say "What way will it go?" before showing how the animal jumps on the ledge.

L. to the Hearing Signer

Whereas M. tends to elaborate with the hearing signer, L. tends to shorten his delivery, and also uses fewer morphologically complex forms and less mime than in any of the deaf conditions. As was discussed earlier, in describing for M. that segment of the cartoon where the wolf is run-over by a van, L. uses mime and signs directly on his own body (e.g. showing the wolf being hit by hitting the back of his own head with his hand and then thrusting his upper body

forward). Like M., L. does not rely on the hearing signer's ability to interpret non-manual information and shows all verbal notions on the hands. Thus, with the hearing signer, when using eye gaze to mark the location that the van comes from, he accompanies the gaze with an indexic point. Similarly, when he role plays the wolf looking behind and seeing the van, L. adds a V-CL that represents the eyes seeing (Gee & Kegl, 1982). He signs this segment similarly to the DH adult. With M., his peer and the DD adult (whom he has just recently met), he uses eye gaze without sign assuming that this will be adequate. That L. applies similar techniques in the two most "hearing" conditions (despite the fact that he knows the DH individual, but that the DD adult and Hearing signers are both essentially strangers) suggests that he and M. both associate the DH and hearing adults with less strong forms of ASL and Deaf Culture. In other instances, he will use mime with the DH adult but not the hearing signer, suggesting that he is further distinguishing between them, perhaps placing them at different points on a continuum between Deaf and hearing values pertaining to communication.

With the hearing signer, L. tends to: shorten his story (in fact, four out of ten key segments from the story were omitted altogether), omit facial expression and body mime, reduce the amount of role play (For example, he entirely omits that segment of the story where the coyote plans his strategy for hanging with suction cups and this segment is almost exclusively role played in the other conditions.), uses signs in ways which are close to citation forms, and uses individual signs to express each element of meaning instead

of using morphologically complex signs which pack many elements of meaning into a single sign.

An example (#21 below) is that segment of the cartoon where the ledge breaks and falls to the ground with the coyote still standing on it. Although there are two themes (nominals) represented in one complex sign: the coyote (by-legs CL) and the ledge (B-CL), L. uses more sophisticated ASL strategies to relay this information in other conditions. Since L. has not established the ledge as a specific referent, the B-CL in this case represents the more general category of wide flat objects. L. omits his elaborate description of the ledge's precarious shape in this condition, a description requiring the use of various classifiers. Whereas the perseveration of half of the ledge classifier in the DD version conveyed the notion of "broken portion of ledge," L. uses separate signs BREAK and COLLAPSE to convey the same notion in the hearing condition. The use of morphologically complex signs in the other conditions allows the audience to easily comprehend why it breaks. L. tells the hearing signer that the "surface-which-the-animal-stands-on" breaks because the animal is too heavy. He uses non-productive signs that generally convey the notions of"break," and "collapse" rather than specifying exactly what breaks and collapses.

ex.21 (L. to the Hearing Signer)

While the coyote is standing on a ledge, the ledge breaks and falls.

L. gazes upwards to indicate that the fall originates from a high place (perceptual agreement) as he sets a by-legs CL

on a flat B-CL (the coyote on the ledge). At first the animal falls down (by-legs CL becomes an S-hand)but then gets up to a standing (by-legs on B-CL again)position. L. then shows the ledge and coyote falling by situating the by-legs CL for the coyote on a flat B-hand and drops the construction towards the ground. He follows this by signing WHY (as a rhetorical question), HEAVY and traces the shape of a rock block on his own foot (as the explanation for the fall of the coyote and the ledge) before concluding with the signs BREAK and COLLAPSE (all of the signs mentioned are non-productive forms).

4.7 Specific Aspects of Each Child's Language Development

4.7.1 M.

M. has acquired increased morphological complexity in her signing. When comparing the video-tapes of M. at six (Goodhart's data) and M. at ten (current data), it becomes apparent that this enables her to express notions which she either omitted earlier or had difficulty with. Specifically, notions pertaining to location in or movement through space are readily expressed via a natural sign language, but not in a pedagogical English-based system. Several units of meaning, for example two nominals and a verbal notion, can be simultaneously encoded in a morphologically complex ASL sign. Thus, the English sentence: "The cup and saucer were placed on the table." would be rendered in ASL in the following manner:

*one hand would assume the shape of the B-classifier representing flat-surface-objects (saucer)

*the other hand would assume the shape of the classifier representing open containers (C-CL) (representing the cup) and be placed on the first hand

*both hands would move together to a

location designated as the table

To present the same sentence in an English-based system would require a greater number of separate individual signs and take longer to deliver. Since the larger muscles of the hands and arms move more slowly, signs take longer to produce than spoken words (Klima & Bellugi, 1979). Therefore, signs must encode more information per unit in order to convey the equivalent amount of information as a string of speech delivered in a specified time frame. English-based signs do not encode multiple segments of meaning in a single sign, and thus are not likely to provide a comparable amount of information in the time it takes to produce and process a spoken utterance. It may be that, if the English-based signed segment is delivered with simultaneous speech, both the production of the utterance and the time needed to process it are slowed down. The information content is likely to be greatly hampered and the burden on the listener's short term memory is likely to be substantially increased (Maxwell, 1983; Gee & Goodhart, 1985).

Slobin (1979) proposes that all languages must satisfy certain constraints:

> 1. They must be clear: The surface forms must clearly represent underlying semantic relations.
>
> 2. They must be processible under the time constraints of immediate memory and communicative pressures.
>
> 3. They must be quick and easy: The speaker must provide a lot of information in a short amount of time before the listener becomes bored, loses track of things, or takes the floor.

4. They must be expressive: By being semantically expressive, languages and language users convey basic meanings. By being rhetorically expressive, a variety of devices are utilized for communicating well and effectively in different contexts.

For sign languages to meet Slobin's charges, they must be morphologically complex and utilize space. It then follows that the process of nativization operating in DH, who are exposed to a medley of linguistic input, would be biased toward development of morphological complexity in order for these constraints to be satisfied (Gee & Goodhart, 1985). M.'s development of morphological complexity has enabled her to become more expressive than she was at the time of Goodhart's study.

The virtual absence of morphological complexity in M.'s repertoire at age six might well account for her inability to describe such aspects of the "Roadrunner" episode as the spatial locations of the two animals when they hang facing one another or the way one of the coyote's legs comes loose while the other remains attached to the tunnel ceiling. Her difficulties in re-creating the story seem due to lack of experience with or exposure to models of story-telling in ASL on the one hand and incomplete access to stories told in an English format on the other. M.'s increased awareness of narrative structure and ability express more notions than she did in the earlier study could be related to several factors: the presence of increased ASL influence in her signing; her exposure to stories both in ASL (from Deaf teachers) and English print (through learning to read and being read to at home and in school); the birth of her

brother; her family's change in attitude towards increased acceptance of ASL and involvement in the Deaf Community.

In the current study, M. opens her re-telling of the story with the formula, "One day...," showing that she knows how stories are introduced in English. Furthermore, across conditions she introduces important information early in her narrative by setting-up the arc-shaped tunnel structure at a location in space. The tunnel is essential as a reference point for much of the activity that follows. Although she still tends to frequently insert "(and) then" as a placeholder while formulating her story, M. also now uses other signs, such as KNOW and IDEA (in the sense of " Do you know what I mean?" or " Catch this description here") as focusing devices. Another discourse device which M. has now acquired is the use of role play.

There is one segment of the story which is usually role played by Deaf signers, both adults and children. It involves taking the coyote's perspective as he contemplates his predicament of not being able to hang from the tunnel ceiling while waiting for the roadrunner. After much musing, he comes up with the idea of attaching suction cups to his feet. In this type of context Deaf individuals may use a role play style which includes mime in addition to or instead of formal signs. In any case, the signer is using the body and face in a manner which is viewed as appropriate and desirable for narrative discourse in the Deaf Community but might be perceived as unnecessarily exaggerated in the hearing community which uses mainstream (spoken) English.

M. at six omitted this segment entirely from her story and in fact used very little facial expression throughout her narrative. In the present study she includes this segment in all four conditions and is able to role play the situation, taking the coyote's perspective and showing that he tosses around ideas in his head until coming up with one that he thinks will work. M.'s beginning awareness of style-shifting is observed in the way she signs this segment across the various conditions. With the DD adult, M. is more formal, using more formal signs, whereas with L., her peer, she uses more mime. This contrast is interesting because it suggests that the peer/adult status and degree of familiarity factor that distinguishes these two individuals motivates her to use role play in different ways. M.'s version of this segment to the hearing signer represents a combination of the strategies which she uses with her peer and the DD adult. In this condition, she is more lengthy and redundant; using many noncannonical forms, but reinforcing them with formal signs that express the same notions.

M.'s use of role play to relay the characters' internal perceptions throughout the story and across conditions indicates that she now has the ability to use her face and body for both segmental and suprasegmental functions in ASL. Her use of linguistic features that are so central to ASL suggests that her family has in a sense sanctioned her involvement and identification with Deaf people and their language.

By comparing M.'s rendition of the cartoon segment where the coyote hangs with suction cups attached to his feet from the rocky ceiling of the tunnel (Example 23 below) with her re-telling of the

same story at age six (Example 22 below), M.'s increased knowledge of morphology is observed.

ex. 22 (M. to L. at age six)

The coyote hangs by his feet from the tunnel ceiling.

M. placed the "by-legs" CL on a B-CL and turned the construction upside down as a unit while positioning it at a high plane in the signing space.

M. at age six showed the coyote hanging upside down from an unspecified high surface. She apparently was unable to analyze the "by-legs" classifier into its meaningful parts to specifically show how the animal moved, how he fell, etc. For example, she did not move the parts of the "by-legs" classifier separately to show the animal walking or jumping up to the rocky ceiling. She gave no indication that something was attached to the animal's feet or that the ceiling's surface was rocky. In the present study, use of productive signing allows M. to specify details and elaborate her story. By choosing G-classifiers, which represent long-thin objects in ASL, she shows the DD adult that the coyote first hangs from the rocky tunnel ceiling, and then loses his grip one leg at a time. M. does convey that heavy objects are attached to the coyote's paws which would cause him to fall. Deaf adults would convey both notions by first using a C, L or modified B classifier to represent the block that comes undone, and then changing to a G-CL to focus on the dangling and falling aspects of this scene. M. clearly is aware that

there are several pieces of meaning to be communicated, and she has developed the ability to assign meaning to components of complex signs which she once used as unanalyzed wholes. However, she is not always sure of the most effective way to code the information she wishes to convey.

ex.23 (M. to DD Adult in the present study)

> The coyote hangs by his feet from the tunnel ceiling and falls one leg at a time.

> M. uses two G-CL handshapes, one to represent each of the coyote's legs. She signs THEN, ONE, hits her own leg, then swings down one of the G-CL hands. She signs SUFFER and THEN, and then signs a sequence about the roadrunner coming by while role playing the roadrunner before showing the the other leg falling. She uses a citation sign for "run," before fingerspelling R-O-A-D and signing "runner" by adding the English-based -ER affix. She signs COME, using a G-hand inflected to show the direction from which the roadrunner comes, and goes into a role play of the roadrunner looking to each side -- first using a V-CL for the eyes, then an S-CL for the head of the roadrunner, then she stands, showing the roadrunner standing and thinking (cheek resting on hand). Next, M. signs (citation signs) THEN OTHER LEG, and repositions her two G-CL hands at the plane where the arc is to show the other G-CL fall. Then she signs TWO LAND (by-legs CL drops onto B-CL) and (with citation signs) ON GROUND.

Some of M.'s productive signs seem to be innovative forms which she is unlikely to have ever seen in pedagogical English-based systems or ASL. However, these forms might be possible signs in ASL. As explained in Chapter 1, because of nativization, DH children exposed to a variety of signed input are likely to innovate in the direction of ASL. An example (#24 below) further illustrates this point:

ex.24 (M. in several conditions)

The coyote is run over by a van.

M. uses by-legs CL for the thing which is run-over, namely the coyote and a bent V-hand for the thing that does the running-over, namely the van or truck.

The bent-V could conceivably be a modification of the classifier for vehicles. This classifier is a 3-hand, opposed thumb plus index and middle fingers turned sideways. M. could be holding the thumb in a slightly bent, and oriented inward, thus making it look like a V hand has replaced the 3 hand. M.'s hand is placed at the location where the action occurs - where the vehicle hits the animal. There is, however, in the dialect of ASL to which M. is exposed, a local sign for truck which is formed by drawing a bent-V across the forehead. It could be, then, that M. is using the local sign for truck instead of a modified vehicle classifier and has set it up at the location where the action is being signed. An adult signer of ASL would most likely first make the sign for truck in its usual location and then use the vehicle classifier to refer to the truck running over the wolf. M. has instead moved the actual sign down to a lower plane and used it in place of the vehicle classifier. The fact that she has used English-based, initialized signs for "van," and "truck" earlier in her narrative supports this hypothesis.

Another example of innovation in M.'s signing is # 25 below where she tells L. that the coyote walks up to the tunnel ceiling with the cups attached and hangs.

ex.25 (M. to L.)

The coyote walks to the ceiling with suction cups attached and hangs.

M. uses a by-legs CL and moves it along an arc to show the coyote walking up the tunnel and then uses two bent-V hands to represent each leg hanging with a suction cups attached. As the right leg swings down, it opens to a bent-5 handshape.

Deaf adults might use bent-G or modified-X hands in this context to represent either bent limbs or rectangular objects attached to the hanging limbs. In fact, one of the oldest DD children in the Goodhart study did use two X-hands for conveying the latter notion. The bent-V handshape used by M. is inappropriate in that it refers in ASL to the entire body of an animate being and its use here on both hands implies that two animals are hanging. However, M. means to refer to one animal and its two limbs. Therefore, she should either use a single by-legs CL to refer to the entire wolf or two G or X hands to specifically call attention to the limbs. If M. has meant to focus on the limbs and selected a semantically inappropriate classifier, she is not alone. Similar choices of handshapes for this segment of the story were made by other DH children in Goodhart's study and one of the mothers in the current study. This hearing mother used the bent-V form on both hands to convey the notion of blocks being stuck on the suction cups which had pulled away from the rocky ceiling of the tunnel. Thus, it may be that M. wished to express the idea of the rocky blocks being attached to the suction cups but wasn't sure exactly how to do this and created this form to meet her communicative need. Furthermore, the fact that others have innovated similar forms provides evidence of nativization at work.

In summary then, M. has become more productive through increased morphological complexity in her sign, which in turn has enabled her to express notions which she may not have been able to convey several years earlier. She has also acquired a broader range of narrative devices and stylistic variation, as seen, for example, in her use of role play. M. seems to be just beginning to sign somewhat differently with different people, but not consistently so. For example, she tends to use more repetition and elaboration with the hearing signer, often backing up her productive ASL signs with English-based and citation signs - ostensibly so that she can be certain this person has understood her intended message. Some of her most morphologically complex signing is to the DD adult who is also essentially a stranger. She tends to use the pragmatic mode with her peer, L.. However, the ability to style-shift/code-switch appears to be a relatively new level of development for M. and at this point in time, her strategies for doing so are not clearly predictable.

4.7.2 L.

Since the Goodhart (1984) study, L. has broadened his linguistic repertoire to include a range of signing styles and forms which he varies according to context (refer back to Tables 4.2 & 4.3). In the present study, L.'s re-telling of the "Roadrunner" cartoon is different in each of the four conditions.

In the peer condition L. tends to be informal, more pragmatic than syntactic, and inclined to use mime while engaged in role play. With a peer, L. also tends to elaborate more than he does with

adults, taking great pains to provide vivid descriptions of critical aspects of the physical environment. An example of this is his careful selection of classifiers to describe the unusual rock precipice which juts out to a ledge that ultimately breaks and falls, taking the wolf with it. With these classifiers, he creates different analogies in his explanation of the shape of the base of this structure; first calling it a spire-like-thing and then later, a bottle-like-thing. He then also carefully draws the shape of the ledge extension in the air. At another point in the story, the coyote, has just been flattened out by a van and is furious because once again the roadrunner has out-smarted him, having zoomed by behind the vanishing van. He now grabs a rock and throws it after the roadrunner/van. But, the rock hits a large boulder precariously perched upon an odd-shaped rocky precipice (shortly thereafter, the boulder rolls down the side of the cliff). In his version to M., L. takes great pains to describe the shape of the rock-cliff-structure, laying the groundwork for the next segment when the boulder rolls down the mountain side. He uses size and shape specifiers (SASSes) to describe both the precipice and the boulder, then describes both structures a second time using slightly different classifiers.

For the DD adult, L. sets this scene by using a by-legs CL to represent the coyote and having the animal turn over and slowly get up before throwing the rock, representing the animal's movements by slowly changing the orientation of the by-legs classifier from prone to standing position. L. also demonstrates his well developed narrative organization skills when he precisely describes the boulder

so that the audience will understand the danger this boulder imposes on the coyote when it soon falls.

With the hearing signer, L. provides no information about the coyote's state of mind, or the nature of the elements involved in this segment. He merely states that something is thrown and then bounces off a rock. The audience is thus unclear as to why the coyote throws the rock or of its significance to the rest of the story. By using an English-based form for "rock," he conveys nothing about the imminent danger of the falling boulder.

By contrast, L. uses precision in describing the characters to M.; taking care to use facial expressions and body movements in his role play of each, to clearly distinguish their personality traits. For example, L. shows the roadrunner kicking up the dust and ruffling his feathers in preparation for a run around and through the tunnel to taunt the coyote. He then shows the coyote, having just jumped up to the tunnel ceiling, facing the roadrunner with flashing eyes and jagged teeth. By bringing the two characters to life early in his narrative, when L. later makes subtle shifts of perspective it is clear to the audience who he is talking about.

L.'s signing of the closing segment of the story once more clarifies how he shifts his style in each condition. In the cartoon, the coyote sticks his head up out of the hole he has made by falling through the ground and is hit by rock falling from overhead. Although there are similarities in how L. signs this segment across all four conditions, the differences support the argument that he favors morphosyntactic complexity with the Deaf adults. He uses mime/role play only with M. With both M. and the Deaf adults, L.

uses a C-CL clitic (The clitic is functionally similar to a pronoun; it is a piece of the original nominal theme and refers back to that theme) perseverated from the two handed classifier sign for "hole." With the hearing signer, L. does not use perseveration. He use a two handed formation for representing "rocks" and modifies it for size and manner of motion.

With both the DD and DH adults, L. alternates between two different signs to convey these notions. One sign is similar to that used with the hearing signer, and the other sign is a variation formed by placing one C-CL hand at a time over the other to show "rocks piling on top of each other."

In short, then, L. uses a variety of forms and alters his style to fit different sociolinguistic contexts. He seems to be aware that he has different language sources to work with and at times mixes codes to focus attention on particular aspects of his message. With people whom he knows he is more likely to use mime and with Deaf adults, he uses the most morphologically complex signing.

4.8 Conclusions

Both L. and M. have developed signing repertoires that are characterized by features associated with natural sign languages in general and ASL in particular. That they have chosen this course of acquisition despite being exposed to a variety of signing input, including English-based sign systems, suggests that the nativization-denativization process operates in deaf language learners with a bias towards natural sign language structure. In the time since the

Goodhart (1984) data collection, M. has caught up to L. in her ASL grammatical development. What is not shown in the counts of Goodhart's target features is that L. may have superior ability to choose classifiers that precisely represent specific notions. However, this aspect of his development is illustrated by the examples discussed in this chapter. L. does seem to have slowed down in his grammatical development while focusing on his discourse/narrative development.

Differences between the children seem to be at the discourse level. While M. is starting to acquire stylistic variation in her signing, L. is ahead of her in this area. That is, he seems to be more aware of the situational constraints which motivate shifts to another code or style than she is at this time. L. is also more explicit than M. in his descriptions of the animals' characteristic traits, behaviors, and appearance. He also is more inclined to provide explanations of why and how events occur. These narrative discourse strategies may help his audience identify each character during role play shifts and make predictions about subsequent events later in the story.

Deaf adults asked to view the video-tapes generally commented that L.'s was signing was clearer and easier to follow. One DD consultant who viewed the tapes suggested that the factors affecting clarity might reflect differences between the two children at the discourse level. He further suggested that L. seemed to allow more pause time between events and in shifting roles from one character to another. According to this consultant, L. is also more precise in using spatial indexing to refer to different characters in the story.

M. tends to refer to the characters by name instead of using pronominal referencing. M.'s shifts of character are unclear because of the lack of pronominal referencing combined with her short pause time. When M. connects events, she uses English "event connectors" (e.g., "then," "and"). This gives her signing an "English-like" flavor even though her grammatical structure within the events is characteristically ASL.

Additional distinctions between the two children might be obtained by further analyzing the data at the discourse level. However, the differences between the children less extreme, compared with the earlier study, suggesting that they have had many shared language learning experiences and furthermore that DH children may eventually arrive at a similar place linguistically although they may take different paths and follow individual schedules.

Chapter Five

Conclusions and Educational Implications

5.1 Introduction

The "nativization" model of language acquisition (Andersen, 1983) provided a theoretical framework for this study. Nativization is a process whereby the individual learner initially constructs a linguistic system that is somewhat distinct from the input language. Gradually, through assimilation and accomodation processes, this system comes to match the environmental target (Andersen, 1980, 1983; Brown, 1973; Slobin, 1977, 1981, 1982, 1983; Suti & Friel-Patti, 1982). Sometimes, in both first and second language acquisition, it is not possible for the individual's system to denativize or merge with the target language. In these cases, the target language is either not completely accessible, or is not adequate to meet all of the learner's needs for a language. In the formation of pidgins, sociolinguistic factors limit the learner's access to the target language. Thus, the learner draws on his internal norms for language and continues to develop forms which are distinct from the input. When pidgins give rise to creoles, the primary parental input is somewhat inadequate and the children construct a grammar that is more heavily based on their biological capacity for language acquisition. In this study, nativization has been used to explain both the acquistion of ASL as a first language by two deaf children of hearing parents and the simultaneous acquisition of sign as a second language by their parents.

These two children, L. and M., participated in a previous study conducted by Goodhart (1984). Goodhart found that, through age six or so, there is substantial individual variation in the acquisition of sign language by deaf children of both deaf and hearing parents (DD and DH). At aproximately age seven, the variability is reduced and there is stabilization within groups. However, the two groups diverge. The DD group produces a significantly higher percentage of morphologically complex forms in their signing than the DH children. L. and M. appeared to be taking very different routes in their language development at the time of Goodhart's study. Yet, they shared many commonalities in their backgrounds. By exploring the possible sources of differences between L. and M., I hoped to generate hypotheses that might shed light on what contributes to the great variability in the DH population. There are important similarities and some important differences in the families of the two children. These children, who have shared common experiences in many aspects of their lives, continue to show both similarities and differences in their language development. Using an ethnographic, descriptive, case study approach, the interaction between nativization and input in their language acquistion was examined.

The outcomes of this investigation suggest possible questions for future research in language acquisition within the deaf population. In addition, the study has important implications for educators of deaf children. The major findings of the study will be summarized below. Thereafter, implications for education and suggestions for future research will be outlined.

5.2 Outcomes of the Study

5.2.1 Nativization and Input

When presented with a variety of input, DH children appear to nativize in the direction of ASL. They may develop morphological complexity in their signing even without regular exposure to adult Deaf models of ASL (Hoffmeister & Goodhart, 1978; Suti & Friel-Patti, 1982; Livingston, 1983). Once given the opportunity to interact within the Deaf Community, ASL becomes the target of denativization as well. L., one of the two children in this study, was very precocious in his ASL development for a DH child. His hearing mother tried to use both ASL and English-based sign with him from the time he was two years old. As a toddler, he was already signing productively (Hoffmeister & Goodhart, 1978). He was one of two of Goodhart's (1984) subjects who used agreement and productive verbs with marked handshapes to the extent used by her oldest DD subjects. It may be that, when hearing parents expose deaf children to a form of signing which is compatible with nativization, the children's ASL development is facilitated. This type of signing is productive, utilizes space, and is morphologically complex. It allows a greater amount of information to be conveyed in a shorter amount of time and may be more processible by the child than English-based sign (Klima & Bellugi, 1979).

M., the other child in this study, received English-based sign as her primary input at home since she was two years old. In the Goodhart (1984) study, her signing was English-based. Productivity was restricted and this may have constrained what she was able to express. She has since had regular involvement with DD peers and

Deaf adults. Her signing has become substantially more productive and morphologically complex. L. & M. now have similar percentages of ASL grammatical structures in their signing. In this way, their developmental paths seem to have converged. This convergence suggests that nativization in the acquisition of a signed language by deaf children is biased in favor of natural sign languages, in this case, ASL. Nativization has also played a role in the mothers' sign language development.

Both mothers now use ASL features in their signing. L.'s mother uses classifiers productively. She uses forms which incorporate several levels of meaning into each sign. Sometimes she uses handshapes which my Deaf consultants would not choose in that particular context. Yet, these forms express the underlying semantic content she wishes to convey. Through nativization acting upon the input she has received from Deaf adults and her son, L.'s mother innovates forms which allow her to communicate clearly and precisely.

M.'s mother now has two deaf children. She uses simultaneous speech and English-based sign much of the time. She does not consciously use ASL with her children, although she supports their use of it with other deaf people. However, nativization has influenced her signing as well, giving it some of the characteristics of a natural sign language -- making it more ASL-like. For example, she modifies her signs to show the path that an action takes. In making the sign for "go," when referring to an object that falls, she orients her sign downward towards the goal or landing site. She uses reduplication to express plurality. In asking her younger child, N., if he has had the same lunch as his older sister, M.'s mother

inflects the sign for "same" so that it, in a sense, agrees with M. and N.. Undoubtedly, nativization has changed M.'s mother's signing, in all probability making it more accessible as input for her deaf children.

5.2.2 Similarities and Differences Between L. and M.

Both children use morphologically complex forms and use such features of ASL as: agreement, perseveration and role play. The two children are now similar in having ASL features in their repertoires. However, L. may be ahead in his ability to do more with what he has. For instance, L. seems to select classifiers which explicitly convey specific notions in cases where M. represents the same notions in a more general way. Both children use stylistic variation in their signing. To some extent, they both sign differently to adults versus peers and Deaf versus hearing persons. L. tends to shorten his message for hearing people while M. is more inclined to elaborate. At this point, L. seems to be aware of the situational constraints which motivate choice of code or style. He tends to use more citation forms, less productivity and an English-based signing style with hearing persons. While M. uses different techniques for expressing particular notions, she does not style shift in any predictable manner across conditions. It would appear that she may be just beginning to develop a sense of when to shift. These observations with respect to style shifting suggest that DH children achieve similar linguistic milestones, but may take different paths and follow individual schedules to achieve these milestones.

Deaf consultants perceived the children to be different in terms of narrative/discourse style. Differences in their discourse development appear to affect how they use the grammatical devices that they have. L. tends to use elaboration in setting up a story so that the viewer can make predictions about subsequent events. Characters are described in detail so that later role-shifting is easy to follow. Old information provides a back-drop for new information and referents are unambiguous. L. allows ample pause time between events and shifts in perspective. These strategies make his narratives exceptionally clear and easy to follow. M. is more inclined to string events together in an English-based style, commenting on the event as she introduces it. She habitually uses the sign for "then" to connect topics or events. This strategy gives her narrative discourse an "English-like" quality, even though her structure within events is very "ASL-like." One consultant perceived L. to be more of a storyteller and M. to be more of a conversationalist.

These distinctions may be related to differences in input. In this study, M.'s mother was most comfortable communicating with her children in a conversational setting. In that context, her signing seemed to be the most fluent and clear. L.'s mother's storytelling style was similar to his. She frequently used elaboration and rhetorical devices. The narrative mode was a comfortable one for her.

5.2.3 Environmental Factors that Make a Difference

When hearing parents use morphological productivity in their own signing, the deaf child's ASL development is facilitated. To the extent that hearing parents associate with and accept Deaf adults, they give their deaf children permission to identify with the Deaf Community. This identification further enhances the child's ASL development. Deaf children in hearing families where communication is mutually accessible are affected by their parents values with respect to language, learning and literacy (Bodner-Johnson, 1986). In hearing families, differences in terms of these variables may account for differences in deaf children's language development to a greater extent than may be true for deaf families with deaf children. However, more research is needed that compares deaf and hearing families from an ethnographic perspective.

5.3 Educational Implications

The nativization model of language acquisition suggests that deaf children come to school with some measure of language-like communication even when they have had limited access to environmental input (Feldman, Goldin-Meadow & Gleitman, 1978; Mohay, 1982). Educators would do best to provide input that is most compatible with the systems that the children have innovated. Nativization in deaf children's language development appears to biased in favor of ASL (Suti & Friel-Patti, 1982; Livingston, 1983; Goodhart, 1984; Strong, 1985). Programs can take this into account and adopt a Bilingual-Bicultural approach to educating deaf children.

In a Bilingual-Bicultural program for deaf children, ASL and English are equally valued. Since ASL seems to be the language

likely to be fully accessible as a first language for most deaf children (Gee & Goodhart, 1985), it would be the primary language of instruction in the early years. For most deaf children, English would be seen as less accessible and would be approached through ASL, using second language techniques. English would be presented using English-based sign (as described in the previous chapters of this paper) and print. Deaf and hearing staff working together would prepare deaf children for living with two languages and two cultures (Grosjean, 1982). Deaf adults who use ASL as their primary language would provide ASL input through both naturalistic interaction and formal instruction. They would also serve as positive Deaf role models. Within this milieu, individual differences with respect to language preference or learning style could be addressed. Perhaps more children would reach their optimum potential in this kind of environment.

5.4 Implications for Further Research

The present study indicates that many factors contribute to individual differences in patterns of language acquisition. More case studies of deaf children are needed to further delineate these factors. Ethnographic studies of deaf children observe both home and school environments and explore the interrelationships between the two (Erting 1981, 1985; Maxwell, 1985 a.,b.). This approach allows the investigator to note the ways in which the deaf child uses the grammatical and discourse skills that he has.

Linguistic analyses which count the presence of specific grammatical features in a given child's repertoire cannot fully

account for differences between children. The children may be distinguished by virtue of how they use these grammatical structures at the discourse level. These differences may account for one child being perceived as more "intelligible" in his signing than another. Thus, future studies need to devise measures which can assess both levels of sign language development, grammar and discourse, and the interplay between the two.

It seems that further research is also needed in the area of literacy development by deaf children. To begin with, it might be asked whether deaf children of signing hearing parents are aided in the acquisition of English literacy by having had access to communication at home. Next, children who have had access to ASL or ASL-like communication from their hearing parents might be compared with peers who had only English-based sign as their primary input. One might then ask to what extent different types of sign input in the early years facilitate later literacy development. Furthermore, the acquisition of story-telling skills in ASL might be compared with acquisition of written language skills in English. Within a bilingual-bicultural program, studies might be done to observe whether prior acquisition of story-telling skills in sign is facilitative of English literacy. It would also be useful to see how deaf children who are taught to read and write are aided in this process by on-going, simultaneous instruction in ASL storytelling.

In addition to studies of deaf children's acquisition of literacy, more research is needed which examines features of English used by deaf children in their signing. For example, to what extent do they incorporate complex English strategies for embedding, such as

the use of relative pronouns, into their signing? Most importantly, further research is needed to determine to what extent deaf children have both English-based sign features and ASL features in their repertoires for expressing the same semantic information. To the extent that they do, what situational constraints prompt them to choose an English-based strategy over an ASL one? Larger scale studies are needed to determine the correlation between developmental level and the use of these two types of strategies interchangeably verus shifting according to a predictable set of variables. Further research at both the grammatical and discourse levels is also needed to investigate whether deaf children, who have access to both ASL and English-based sign, use only one of the two for specific communicative and/or linguistic functions. Studies should also focus on children who have had exposure to only English-based sign. Do these deaf children use English-based sign across a complete range of linguistic functions, or do they perhaps prefer the use of nativized, ASL-like forms in specific discourse contexts?

Appendix I

Glossary

1.deaf: persons who are born with (or acquire prior to the age of two) a loss of hearing so severe (with or without amplification) as to prohibit the acquisition of an aural-oral language through natural exposure to and interaction with native speakers of that language; may also apply to some persons who acquire a loss of hearing during childhood, adolescence, or early adulthood which (with or without amplification) restricts their access to social interaction and communication among hearing people; furthermore, may apply to persons with less severe losses (congenital, prelingual, or adventitious) who in some contexts, are substantially restricted in their access to communicative interaction among hearing people (see also: Moores, 1982; Freeman, Carbin & Boese, 1981)

2.Deaf: persons with a hearing loss who identify with the Deaf Community

3.Deaf Community: community of individuals who have a hearing loss and who share similar values, beliefs, attitudes about deafness, and patterns of interacting with one another and the larger Hearing society; ASL is recognized as the official language of and is preferred by Community members; some hearing persons are included as non-core or unofficial members of the Deaf Community (see Baker & Cokely, 1980; Higgins, 1980)

4.American Sign Language (ASL): A visual-gestural language which developed within and is used by the Deaf Community in the United States and parts of Canada (Baker & Cokely, 1980). Just as there are varieties and dialects in spoken languages, there are varieties and dialects of ASL (Woodward, 1978; 1982). Furthermore, the ASL of first and second generation deaf individuals appears to be distinguished by virtue of the degree and nature of inflectional morphology seen in each (Newport, 1982; Goodhart, 1984; Gee & Goodhart, 1985; present document)

5.classifier: handshape which represents nouns of a specific semantic category; classifiers substitute nouns somewhat in the way pronouns substitute nouns in English (see, also, Padden, 1978)

6.SASS (size and shape specifier): often two handed, special type of classifier, represents a noun by describing its size and shape (Padden, 1978)

7.theme: the case role of the noun phrase in a clause that names an entity which moves (e.g., "The train left the town) or which is placed at a location (e.g., "I put the book on the shelf) (see, also, Jackendoff, 1972)

8.morphological complexity: units of meaning layered onto or built into single signs; modulation of signs to show fine distinctions of meaning; use of classifiers or handshapes that explicitly express specific semantic content while moving between locations in space to convey specific verbal notions; conveying complex multi-propositional notions by modifying the shape, movement, orientation etc. of a base sign

9.productivity: signs are not used in citation, or base form as they would appear in a dictionary of signs - rather they are inflected to convey specific shades of meaning as appropriate for the situation in which they are being used

10.role play: the signer takes the character's perspective in a story; the signer becomes the person who is directly speaking or person performing or being the recipient of an action; often signaled by body shift or change in direction of eye gaze; sometimes signaled by taking on the characteristics of the person being enacted (Loew, 1984)

11.formal sign or cannonical form: offical, conventionalized linguistic unit in either ASL or one of the English-based systems; in reference to ASL, may be either citation sign or productive sign

12.noncannonical form: mime or gesture -- used instead of cannonical forms to express propositional content

13.mime: signer uses full body and face to express propositional content rather than showing this content on the hands using cannonical signs (either ASL or English-based); in role play/mime the signer first enters the role play mode and then delivers some of the propositional content expressed by that character using non-cannonical strategies; mime is highly contextualized in comparison to sign; for some researchers and linguists studying ASL, the term has negative connotations as it has been grossly misused; it is thus used cautiously in this document to describe a very specific type of behavior which, although non-cannonical, appears to be used by some Deaf signers in certain discourse situations

14.gesture: use of the hands and or face, or sometimes other upper body parts (e.g. shoulders) to communicate relatively straightforward ideas or emotions (see Eastman, 1976); may be universal or culturally specific; like mime, gestures are highly contextualized and thus interpreted differently in different situations; used here to refer to forms which do not involve use of the full body and which are non-cannonical relative to signs in ASL or one of the pedagogical English-based systems

15.redundant, redundancy: repetition by the signer of the same propositional content in the same or slightly different format at several points within a section of discourse to reinforce or emphasize an important concept for the receiver

16.pragmatic mode: use of constructions in a segment of discourse which are loosely connected, not deeply embedded, heavily dependent on context for clear interpretation; in sign language mime and gesture may be used instead of formal signs in the pragmatic mode; in spoken language, the pragmatic mode is characterized by constructions that do not have tightly bound subordinated components (see Givon, 1979)

17.syntactic mode: arises out of the pragmatic mode as constructions become tightly-bound, separate words become grammaticalized as morphemes attached to or absorbed by other classes of words, characterized by increased embedding and subordination and less dependence on context for clear interpretation; in case of signing, formal signs are used which are morphologically complex and extremely productive; less reliance on context; reduced use of gesture and mime (see Givon, 1979)

18.perseveration: a classifier or handshape used in the formation of a productive sign is maintained at an established location with one of the signer's hands while is free to form another sign and convey another notion or series of notions; part of a two handed sign formation may be perseverated while the other hand assumes a new handshape to represent another action or convey another notion; example is the establishment of a tunnel at a specific location using two hands and then maintaining one hand at that location (retaining the same handshape) while the other hand assumes a shape representing an animate being walking up the tunnel

Appendix II.

Possible Scenarios for Deaf Children Acquiring Language

Introduction

Deaf children acquire language in a variety of home environments which differ in terms of accessibility of the language of their primary caretakers, as well as social and cultural variables which influence language development. While each deaf or hearing family raising a deaf child will have unique characteristics that distinguish it from any other family, it is possible to describe several hypothetical scenarios which roughly typify the home environments of deaf individuals. The four scenarios identified in Chapter 3 are described below.

Scenario I

The Deaf Child Of Deaf Parents

Since most deaf children have hearing parents (Mindel & Vernon, 1971; Freeman, Carbin & Boese, 1981; Moores, 1982), the deaf parents of deaf children typically are themselves DH. That is, these deaf parents had limited access to the English input in their hearing homes, most likely communicated with their hearing parents through a restricted vocabulary of spoken words combined with a gesture system that possibly represented extended nativization, and are likely to have begun acquiring ASL from deaf peers at school after the the age of five. Even when acquisition of formal ASL begins in late

childhood or adolescence, Deaf adults have been using it within a community of Deaf peers (both DD and DH) for a number of years before they become parents of deaf children. Thus, they have acquired a variety of forms and styles to suit the many functions for which language is needed and used.

In terms of the conditions under which it develops, the ASL of first generation deaf people may be similar to an extremely expanded pidgin (Mounty, 1984a.; Gee & Goodhart, 1985). That is, a pidgin which over time is used by a group of people for an increasing range of functions and which therefore develops derivational depth and greater referential power (Muhlhauser, 1980). In these circumstances, the pidgin functions as a shared second language for groups of people with different first languages. Expanded pidgins are somewhat unique in that they are characterized by adult language acquisition. However, in the corresponding ASL case, there is no other first language to which the language users have had full access. The ASL case constitutes a restricted L1 which gradually expands and deepens over the years. Since it is often acquired relatively late for a first language (age five and later), this expansion continues well into adulthood as with the parallel pidgin situation. Also, like pidgins, which are used only in specific situations, the use of ASL has historically been prohibited in certain contexts, for example the classroom, and hearing educators have relegated ASL to an inferior status (Kannapell, 1978; Lane, 1984; Strong, 1985). Consequently, the DH child, not having exposure to ASL in some situations, and at the same time lacking full access to English, may not fully develop certain linguistic forms or styles

or may not develop them until much later in life. Although language acquisition continues throughout life (Romaine, 1984), it appears there are some aspects of language that may be best acquired only in early childhood (Slobin, 1979; Fletcher & Garman, 1979; Moores, 1982; Wanner & Gleitman, 1982). Given that many DH individuals do not have adequate exposure to a language that is fully accessible to them in all settings and further that exposure to an accessible language is frequently delayed beyond the first few years of life, DH individuals who become parents of a deaf child may provide linguistic input that does not meet all of that child's needs for some functions of language. The DD child thus goes beyond his input and develops a variety of ASL likely to be characteristically distinct from the ASL of his parents.

The DD child of parents who sign is likely to have more access to communication with his parents than the DH child (Vernon & Koh, 1970; Schlesinger & Meadow, 1972; Moores, 1982) and the input available to him in the home environment is likely to be more stabilized than that of DH children (Gee & Goodhart, 1985). Through the process of nativization interacting with his input, the DD child develops a dialect of ASL which is distinguished from the ASL of his parents in ways similar to those distinguishing creoles that emerge from expanded pidgin input. Both the creole and the second generation variety of ASL are characterized by having greater derivational depth (morphological complexity, productivity), increased referential power and a wider range of stylistic variation (Slobin, 1979; Muhlhauser, 1980; Gee & Goodhart, 1985) than the parent input languages.

Interestingly, as morphological productivity distinguishes spoken creoles from even the most expanded and stabilized pidgins (Mulhauser, 1980), it is the factor which distinguished the oldest DD and DH groups in Goodhart's (1984) study. As indicated by her findings, only two of the DH children had developed substantial morphological productivity in their signing by age seven. These subjects had similar educational experiences which included exposure to DD peers and many have had exposure to Deaf adults as well. Thus, one wonders whether the home environments of these two DH subjects included more exposure to ASL, either from hearing parents who were acquiring it as a second language or from additional involvement with Deaf adults outside of the school environment.

Deaf children of deaf parents also tend to surpass their deaf of hearing peers (Moores, 1982) and perhaps their own parents in the development of English literacy. This seems to be attributable, at least in part, to having had full access to linguistic communication from birth. The result of this input was a more formalized and developed "first language" at an early age from which English can be learned as a second language (Collins-Ahlgren, 1974; Hatfield, Caccamise & Siple, 1978) However, it is important to mention that Deaf parents vary in terms of the ASL and English input they provide for their deaf children and in their ability to draw upon ASL to facilitate their children's learning of English (Brasel & Quigley, 1977; Maestas Y Moores, 1980; Erting,1981). Consequently, in studying the acquisition of language in the DD population, much individual variation is found and there is a need for studies which illuminate the sources of this variation (Newport & Meier, 1984). An

examination of these sources on a case analysis basis may shed light on the particular factors which promote optimum ASL-English bilingualism.

The DD scenario is not explored in the current project but the framework used to examine the DH cases in this study can be equally useful in analyzing the bases of individual differences in both the DD and DH populations of language learners.

Scenario II

The Deaf Child Of Hearing Parents In An Oral-Only Environment

Hearing parents were for many years advised by professionals to rear their deaf children in exclusively oral environments. Despite the increasing popularity of the "total communication" approach since the early 1970s, that advice continues to be given by some professionals and there are schools/programs for the deaf which remain strongholds of oralism (Moores, 1982). Furthermore, there is an undercurrent belief prevalent even in many programs for the deaf which are not oral-only, that oral is better; a sense that English and speech have superiority over ASL or any form of sign language (Kannapell 1982; Lane, 1984).

Consequently, it is not uncommon for hearing parents of newly identified deaf children to initially opt for an exclusively oral approach to rearing their deaf child. In time, many parents adopt other philosophies, but substantial numbers of deaf children continue to spend their early years attempting to learn a first language in a home environment which either does not recognize the existence of

sign language or doesn't sanction its use. Along with the absence of a viable communication system, many deaf children are subjected to a value system which is characterized by heavy denial of the realities of deafness. In other words, these deaf children are expected to acquire a first language which is auditorially based through interacting in social/cultural contexts which presume the ability to hear.

In this scenario, the child is likely to be fitted with a hearing aid at the time of identification of hearing loss. When tested in a sound-treated room, the device seems to remarkably "improve" the child's ability to hear, but these tests cannot simulate the real world as a deaf child perceives it or the multitude of situations that the child must cope with every day. It is expected that the child will acquire English as a first language by using speechreading and whatever residual hearing can be developed with the use of amplification as he matures. The parents are advised not to gesture with the deaf child and to concentrate on talking with and around him at all times. A strong undercurrent message that prevails is that somehow the deafness will be cured by denying its impact on the total development of the child (Freeman, Carbin & Boese, 1981).

Typically, the child is seen, perhaps several times a week, by a speech and language therapist in a hospital setting and this professional provides the mother with instruction in techniques that can be used at home to stimulate language development and communicative interaction through oral/aural means. Beginning at about age three, the child usually attends a nursery school for

hearing children several mornings a week. He has had no contact with deaf adults or other deaf children to date.

In the extreme actualization of this scenario, deaf children are denied full access to linguistic communication. Although the parents may provide perfectly adequate oral/aural English input, the children's ability to utilize this input is severely constrained by their limited ability to hear. Speech delivered by the profoundly deaf child is largely unintelligible (Freeman, Carbin & Boese, 1981; Stevens, Nickerson & Rollins, 1978) and his English vocabulary and syntactic development is typically dramatically delayed (Quigley, Power & Steinkamp, 1977). To complicate matters further, the pragmatics of communication that operate among hearing persons are likely to be different in some respects from those associated with in Deaf Culture where communication occurs in the visual-spatial realm. Such things as a comfortable degree of proximity between speakers, attention getting behaviors, and cues for turn-taking that are optimal for oral language interaction may be completely out of phase with the deaf child's needs. Consequently, the deaf child in this scenario may be further cut off from communicative interaction with hearing persons and may not have the opportunity to observe alternative pragmatic rules operating among deaf persons.

Nevertheless, at a young age these deaf children frequently develop some degree of communicative competence using a gesture system which comprises a set of symbols representing real world objects and actions and a set of rules for combining these gestures to express basic semantic relations such as object-action, object-location, and possessor-object (Goldin-Meadow and Feldman 1975;

Goldin-Meadow and Mylander, 1984). Whether it is the deaf child or the hearing parent who first uses a particular gesture is less significant than the fact that unconsciously and against the advice of professionals, parent and child negotiate a system which supplements speech to make communication more viable. This gesture or "home sign" system is composed of some of the least marked and most universal features of language such as the property of syntactic recursion. While these aspects of language appear not to depend on input for their development, they perhaps depend upon the input supplied by social interaction as a triggering device. That is, when the hearing caretakers (often unconsciously) adjust the dynamics of pragmatics to accommodate the deaf child, the emergence of a language-like communication system may be facilitated. In fact, the literature on pidgins/creoles suggests that similar features of language development occur relatively independently of input in situations where intake is severely restricted because of extreme variability in the input and where exposure to the superstrate language as spoken by native speakers is limited (Andersen, 1983; Muhlhauser, 1980).

A deaf child reared in this exclusively oral scenario is not likely to develop complete linguistic competence in English, and given the absence of another input code, is not likely to develop any other language of a standard variety. His spoken and gestural output may be functional for purposes of communication with his family, but is likely to be restricted in naturalness, have limited stylistic variation, and lack productivity. However, if this deaf child later comes in contact with the Deaf Community and is exposed to ASL, it is

predicted that he will develop linguistic and communicative competence in that language later in life, although his ASL is likely to be of a different variety than that produced by DD individuals. It is further hypothesized that later-in-life ASL acquisition will be facilitated by the fact that it is the first language to which the orally - reared DH individual will have full access. In other words, the motivation to develop ASL as a first language long after a first language is typically acquired will be strong because of the need to have a language that can be accessible and functional for all purposes. However, individual differences: audiological, psychological, social, linguistic, and experiential affect the extent to which English (in both oral and written form) has been available for each orally-reared deaf person. These same individual differences will dictate the degree to which late-in-life mastery of ASL occurs. Furthermore, the extent to which an early home sign or gesture system is functional for the purposes for which language is needed may well influence the child's ability to later utilize oral language and formal sign language input.

Scenario III

The Deaf Child Of Hearing Parents Who Adhere To A Strict English-Based Sign System

With the advent of "total communication" in the 1970s, a number of signing systems were invented for the purpose of representing English on the hands (Wilbur, 1979; Freeman, Carbin & Boese, 1981; Moores, 1982). These systems, which borrow the lexicon of ASL, were intended to be used with simultaneous speech in order to make English

more accessible to the deaf child than it would be through oral-aural means alone (Gannon, 1981; Freeman Carbin & Boese, 1981). This type of English-based signing is to be distinguished from a form of signing which also uses the ASL lexicon but incorporates other ASL features, for example spatial indexing, facial expressions, and morphological modulation. While the latter variety of signing does also adhere primarily to English word order, it does not add signs to represent English morphological affixes and typically does not use many intialized signs. Some users of this variety do use signs or fingerspelling to represent English function words. The latter type of English-based signing (known as PSE, MCE, etc.) emerges through natural communicative interaction in communities which are bilingual in ASL and English, between Deaf and hearing signers and among Deaf people who use both languages (Baker & Cokely, 1980; Woodward, 1982). By contrast, the invented systems were imposed upon deaf children by individuals who perhaps did not give sufficient consideration to psycholinguistic or sociolinguistic factors which might bear on the soundness or efficacy of the approach.

The goals which Scenario III parents have for their deaf children are likely to be the following:

1. That the child will acquire English as a first language

2. That the child will develop speech, and that this will be facilitated by the addition of signs

3. That the use of an invented English-based system will result in the acquisition of English literacy

Scenario III parents, like the parents who choose an exclusively oral approach (Scenario II), are interested in maximizing their children's potential for developing the use of whatever residual hearing is available. They also want their deaf children to develop clear speech and good speechreading skills. They pursue these goals through early intervention programs that emphasize speech and language "therapy," and provide their children with hearing aids. What distinguishes these parents from Scenario II parents is their belief that the addition of a sign system will enhance their children's opportunities for attaining such goals. Scenario III parents typically recognize that their deaf children need deaf peers to play and learn with. Consequently, they are likely to select an early intervention program which includes opportunities for deaf children to meet as a group several times a week as opposed to sending their child to a pre-school for hearing children. These parents are also likely to be interested in meeting deaf adults and may want their deaf children to as well. They appreciate the assistance that deaf adults can provide in helping them understand how deaf people experience life. However, Scenario III parents are not likely to be comfortable with deaf adults who do not use speech and are unlikely to see the importance of ASL for the young deaf child. They are biased in favor of English-based sign and English in its written and spoken forms as language input for deaf children.

Undoubtedly, the addition of English-based sign facilitates communication between hearing parents and their deaf children (Schlesinger, 1978). In all possibility, it may make the parents more sensitive to necessary adaptations in the pragmatic domain.

Subsequently it gives the child increased access to environmental input in the development of a language base. However, with most deaf children, English simply isn't likely to be acquired as a first language. Since English is a language intended for the ear, it cannot be adequately represented on the hands. For instance, such non-segmental aspects of the language as variations in the speaker's voice which distinguish declaratives from interrogatives or signal communicative intent cannot be adequately conveyed in the manual mode (Kluwin, 1981). It is also not clear that all of the segmental components which are represented on the hands can be processed by the child. English-based sign systems use manual markers for tense, aspect and derivations of words from other classes of words (e.g. verbs from nouns, or adverbs from adjectives) but deaf children who are exposed to these systems do not necessarily use these markers in their own signed sentences (Bornstein, 1982; Zorfass, 1981). It may be that the markers are not perceptually salient in the manual mode. An alternative explanation is that the markers are ignored by the child due to constraints on memory. This phenomenon relates to the increased time required to produce or process propositions in simultaneous sign plus speech in comparison to information which is either signed only (via a natural sign language such as ASL) or spoken only (Klima and Bellugi, 1979).

Many children who are presented with sign system input do develop language and are able communicate effectively with their parents (Schlesinger and Meadow, 1972; Schlesinger,1978; Hoffmeister & Goodhart, 1978). However, it is not certain what the child learns about language from the sign system itself, and it's certainly not

clear what they learn about English (Maxwell, 1983). In fact, often the signing of children reared in Scenario III contains elements that are not features of English and in fact are more similar to ASL and other natural sign languages even before they are exposed to ASL (Hoffmeister & Goodhart, 1978; Suti & Friel-Patti, 1982). What this suggests is that when an invented English-based system is the primary input to a deaf child, nativization biases the child to transform the input so that it becomes structured more like a natural sign language.

It is useful to perceive the relationships between the child's innate capacity for language, the environmental input, and the structure of natural sign languages such as ASL within a dynamic framework. One possibility is that the parents' input may change over time as they become more proficient signers. The deaf child contributes to the parents' sign language development even as the parents contribute to the child's over-all language development. In the beginning, the parents are likely to modify their communication in response to the young deaf child's indication of comprehension (or lack thereof) during specific incidences of interaction. As the child's sign language repertoire develops, the parents are likely to incorporate into their own system, features which were introduced by the child. That is, the child may present the parents with a strategy that expands or modifies the parent's way of conveying a particular type of information. The parents may then adopt the child's strategy when later expressing similar content. Although the parents strive towards maintenance of English word order, they may, for example, use space to indicate the location of actions or persons

who are performing those actions. The parents' incorporation of these natural sign language features stems from interacting with the child, who, through nativization, has modified the input to include these aspects. Either nativization forces have operated on the parents' sign system to make it more functional, and efficient, or in modifying their signing style to match that of their child, the hearing parents have actually denativized towards their child's norm.

In Scenario III, as in any other environment, the input seems to have little bearing on some aspects of linguistic development but is crucial for the emergence of other of aspects. One feature of sign language acquisition which actually appears to be hampered by the lack of a specific type of input in this case is the development of complex morphological recursion. It seems that it is the absence of this feature which differentiates the sign language of DH reared in Scenario III type homes from DD in Goodhart's (1984) study. For example: When DD tell about an animal who falls from a rocky ledge, they tend to modify the morphophonology of the sign meaning FALL to show the physical characteristics of who or what fell and the path of motion during the fall. The findings of Goodhart (1984) would suggest that at least through age nine, Scenario III children, as a group, are using frozen signs in attempts to convey the same notions and frequently seem to stumble as they try to show subtleties of meaning.

The property of morphological recursion is a key feature which distinguishes creoles from expanded pidgins. As adults use a pidgin for an expanded number of functions over a period of time, the pidgin acquires increased naturalness, redundancy, lexical productivity and

stylistic variation. However, creoles reflect what children contribute to a language when they acquire it natively, i.e. morphological recursion and derivational depth (Mulhauser, 1980). It would be interesting to see to what extent deaf children reared in Scenarios II and III ultimately acquire these elements in their sign language and whether Scenario IV children seem to develop differently along this parameter.

If, in fact, Deaf adults do develop this crucial feature later in life, current assumptions about critical periods for acquisition of certain aspects of language will be challenged.

Scenario IV

The Deaf Child Of Hearing Parents Who Provide Both ASL-Based And English-Based Input

Scenario IV parents are unique not so much because of the way they sign as because of the attitudes they adopt towards deafness early on. At the time of identification of deafness, these parents are no less aggrieved than other hearing parents that their child is very different from them. However, they place a high premium on the importance of shared open communication with their child and soon come to realize that this will have to happen in a way that is optimal for the child. They are just as apt to provide their deaf children with hearing aids as Scenario II and III parents and to seek an early intervention program which includes speech and language therapy. What distinguishes them from other parents, is their early understanding of the role of ASL and the Deaf Community in their own and their children's lives. These parents are likely to come in

contact with deaf adults who are members of the Deaf Community not long after their child has been found to be deaf.

At first, meeting deaf adults very likely shatters the parents' secret hopes that the deafness will somehow go away and the child will become more like them (Freeman, Carbin & Boese, 1981; Moores, 1980). While Deaf adults may embody hearing parents' greatest fears, they can also be the key to the family's ultimate understanding and acceptance of their child's deafness. Through learning ASL and recognizing its importance in unlocking a deaf child's cognitive and linguistic potential, hearing parents communicate to the child their validation of him as a deaf person. Along with giving the child a sense of worthiness, this kind of acceptance of deafness very likely has a profound impact on the child's language development (Schlesinger & Meadow, 1972; Mindel & Vernon, 1971).

Initially, Scenario IV parents may learn a pedagogical English-based sign system from a book, or a hearing professional. However, regular interaction with Deaf adults soon brings changes to their signing - they incorporate ASL features into their expanding repertoire. In various situations, they may naturally adopt either a more English-based or ASL-based style. The child's input in the communicative interaction, the setting of the interaction, the parent's intent, and the content of the information being conveyed all affect the style that is used.

While the input in this scenario is likely to be more variable than in the other DH situations, the parents have far more flexibility to work with. They are thus able to respond to the natural processes that occur in any communicative interaction and to

pursue a broader range of communicative and linguistic goals with their deaf child. The variability activates the child's nativization processes and the parents' acceptance of deafness. ASL reinforces the child's accommodation to and assimilation of the input in ways that are optimal for a signing modality. Communicative interaction in a range of contexts and the ability of parent and child to learn from one another facilitates the child's acquisition of both sign and English.

Consequently, the sign language of a Scenario IV DH child may be distinguished from that of other DH peers in such ways as the degree of morphological complexity and stylistic variation. Furthermore, this environment may assist the deaf child in his development of English literacy; both trends showing that environment does make a difference in many aspects of DH language development (Bodner-Johnson, 1986).

Scenarios I through IV exemplify more or less distinct ethnographic milieus with respect to families of deaf children. In reality, families often are mixtures of several scenarios. Moreover, at different points in time, a family may be representative of different scenarios. Actually, many other factors besides how a particular family responds to deafness contribute to its ethnography. Religious, ethnic, and economic variables are central. Attitudes towards education and styles of literacy and learning are equally important, not to mention intra-family relationships, influences, and support systems.

Appendix III

Guidelines for Ethnographic Data to be Collected

Name of informant_____

Date of Birth _____ Place of birth _____

Deaf or hearing _____

If deaf:

Parents deaf or hearing?

Age of onset of deafness ____

Age deafness identified ____

Age first exposed to sign language_ ____

Was this at home?_ ____

In school? ____ In classroom? ____

Outside classroom ____

Age began school ____

Day or residential school ____

How involved are you in the Deaf Community (Discuss nature and extent of involvement in both deaf and hearing families)?

What kinds of social/cultural ties or involvement do you have in the larger hearing society (Discuss involvement with extended family, sharing friends, sports, movie-going habits, etc.)?

Discuss attitudes toward American Sign Language (ASL) and English.

Discuss attitudes towards use of sign language with deaf children and with hearing children.

Should deaf children be exposed to ASL? How and in which settings?

Should deaf children be exposed to English (spoken, written, etc)? How and in which settings?

Which languages and language varieties (ASL, spoken English, sign English, etc.) should be used in schools/programs for the deaf? Discuss how and when and by whom each might be used.

Discuss opinions about deaf vs. hearing teachers for deaf children and the roles played by deaf and hearing people in schools for the deaf.

What is the parent's role in their children's education (Discuss in terms of both deaf and hearing children.)?

Discuss goals (educational, social, etc.) that informants as parents have for their children (Discuss for both deaf and hearing children and whether or not these goals are different for each.).

Discuss activities that family shares as a unit:

- sports (watch, participate?)

- movies (watch at home ____ go to movie theatre ____ captioned films for the deaf at friends' homes or deaf club, etc?

- television

- reading

- board games; cards

- Deaf Community functions

- extended family social functions

- cultural activities (art, theatre, music, other)

Observational Notes and Comments:

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VITA

JUDITH LYNN MOUNTY

EDUCATION

1986 — Ed.D., Applied Psycholinguistics
Boston University

1976 — M.Ed., Education of the Hearing Impaired
Temple University, Philadelphia, Pennsylvania

1974 — B.S. Cum Laude, Elementary/Special Education
Boston University

RESEARCH SUPPORT

1985-86 — USA Department of Education, Office of Special Education. "The Effects of Parental Input on Language Development of Deaf Children". Grant # G008430017. Boston University.

PROFESSIONAL EXPERIENCE

1984-Present — R.E.A.D.S. Collaborative Program for the Hearing Impaired, Lakeville, Massachusetts

Supervisor of Staff, Curriculum Coordinator
Responsible for coordination of research projects and staff development, inservices; coordinate implementation of bilingual/bicultural education approach for deaf/hearing-impaired students

1984-Present — Consultant, South Shore Collaborative, Hearing Impaired Program, Hingham, Mass.

1981-84 — Instructor, Boston University, Education of Hearing Impaired and Deaf Studies programs; Coordinator of Field Placements

Courses taught:
Instructional Strategies for the Hearing Impaired
Expressive/Receptive Vocal Processes
Guest lecturer: Language Acquisition

1980-84 — Elwyn National Rehabilitation Center, Philadelphia, Pa., Project Consultant & On-site Administrator/Coordinator of Project IDEAL for deaf/hearing-Impaired children

Responsible each summer for hiring and supervising a multidisciplinary staff of 15-20 that included: speech and language therapists, classroom teachers, counselors, and art/movement therapists in an academic and enrichment program that had a student population of sixty (ages 2-12). Also involved in curriculum and staff development with the agency over this five year period

1977-81 Coordinator/classroom teacher, total communication program for deaf/ hearing-impaired, Hackett Public School, Philadelphia, Pa.

1976-77 Intinerant teacher, hearing impaired, Philadelphia Board of Education, Philadelphia, Pa.

1975-76 Tutor, Hearing Impaired, Philadelphia Board of Education, Philadelphia, Pa.

1974-75 Substitute Teacher, Elementary, Mamaroneck, New York Public School System

PROFESSIONAL CERTIFICATES

Massachusetts: Elementary Education, Hearing Impaired, Moderate Special Needs

Pennsylvania: Elementary Education, Hearing Impaired, Mentally Retarded, Socially & Emotionally Disturbed, Physically Handicapped

Council of Educators of the Deaf (CED)

PROFESSIONAL MEMBERSHIPS

Council on Education of the Deaf
National Association of the Deaf
Massachusetts State Association of the Deaf

FELLOWSHIP AWARDS

1983-84 & 1982-83 Gallaudet College for the Deaf Alumni Fellowship Fund

PROFESSIONAL ACTIVITIES

June 1986 Presentation, Conference on Theoretical Issues in Sign Language Research and Acquisition, Rochester, New York

March Testified before the Joint Committee on Education,

1986	Massachusetts State House, in support of Bill 1458 to establish a Deaf Education Unit in the Division of Special Education of the State Department of Education
1985-Present	Education Committee, Massachusetts State Association of the Deaf
1985	Guest lecturer, Southeastern Massachusetts Speech and Hearing Association: Language Development in Deaf/Hearing Impaired Children
	Consultant, The Hayden School Program for Emotionally Disturbed Deaf Adolescents
	Consultant: City of Quincy Department of Special Education in Due Process case
	Guest lecturer, Boston University Education of Hearing Impaired Program, Course in Expressive/Receptive Vocal Processes
	Guest lecturer, American Sign Language course, Taunton High School, Taunton, Massachusetts
1984	Boston University Psycholinguistic Colloquium, March 29, "Nativization and Grammaticalization in ASL: An analysis of the 'FINISH' Sign," presentation of research project
1983	Horace Mann School for the Deaf, Boston, Massauchusetts., "Teaching Reading to Deaf Children," workshop for parents
	New England Teachers of the Deaf Conference, Haverhill, Ma., "The Role of Context in Reading," presentation for teachers of the deaf
	Massachusetts Eye & Ear Infirmary, "Social-Emotional & Educational Implications for Different Degrees of Hearing Loss", presentation for parents of deaf/hearing impaired pre-schoolers
	Presentation, Worcester, Massachusetts, Hearing Impaired Program, Parents Sign Language Class, "Total Communication for all Hearing Impaired Children"
1982	Presentation Massachusetts Speech and Hearing Association, Workshop, Worcester, Ma., "Language Development, Hearing Impaired Children, and the Role of the Speech & Language Clinician"
	Guest Lecturer, "Reading and the Hearing Impaired", Trenton State College Hearing Impaired Program, Trenton, N.J.

Guest Lecturer, Parents Group, The Learning Center for Deaf Children, Framingham, Ma.

1978-81 Cooperating Teacher, Temple University Master's Candidates in Education of the Hearing Impaired

1980 Cooperating Teacher, Beaver College, Special Education Student

Consultant, "Project Sound" - New Jersey Curriculum Development Plan for Deaf/Hearing Impaired Pre-schoolers

Guest Speaker, Parents of deaf pre-schoolers, Camden County, N.J. Special Education Program

Guest Lecturer, Graduate Program in Speech Pathology and Audiology, Hahneman Hospital, Philadelphia, Pa., an introduction to the philosophy of "total communcation" and explanation of ASL and English-based sign systems

1979-80 Board Member, Deaf-Hearing Communications Center, Springfield, Delaware County, Pa.

1979 Seminar on Education of the Hearing Impaired, Bell Telephone Auditorium, Philadelphia, Pa., presentation on educational options available to deaf/hearing-impaired children in the public school system

Guest on local television program, "Perspectives", interviewed on topic of "Current Issues in Education of the Deaf", Philadelphia, Pa.

Participant, local television debate, "Issues in Education of the Hearing Impaired", on "Meeting House", Philadelphia, Pa.

Guest Lecturer on "Mainstreaming Deaf Students", Central City Deaf Club, Philadelphia, Pa.

1975-78 Guest Speaker, "Personal Experiences with Deafness", BOCES (Board of Cooperative Educational Services), Hearing Impaired Parents Group, Westchester County, New York; Speech & Hearing Program, West Chester State College, Pa.; Temple University Graduate Program Sign Language Classes; Interpreter Training Program, Community College of Philadelphia, Pa.

PART-TIME PROFESSIONAL EMPLOYMENT

1980-81 Private tutoring in English, Deaf adults

1977-79 M-5 Group Homes for mentally handicapped deaf adults

1976-79	Private consultation, tutoring and family intervention, hearing families with deaf/hearing impaired children
1974	Emotionally disturbed, Nazareth School, Jamaica Plain, Ma.

PRACTICA, FIELD EXPERIENCE, TRAINING

1982	Clinical Psychology Field Placement, Intervention with family of a young hearing impaired child (Boston University)
1976	Multi-handicapped Deaf, Woods School, Langhorne, Pa.
	Hearing Impaired - Delaware County Intermediate Unit, Pa.
1974	Emotionally Disturbed - Nazareth School, Jamaica Plain, Ma.
	Elementary, Newton, Ma.
1973	Brain-damaged adolescents, Beaumont School, Liberty, N.Y.
	Elementary, Boston, Ma.
1972	Reading Disabilities, Mamaroneck, N.Y.

References available upon request